PORTABLE 100

The magazine for Model 100 users

MAY
1984
$2.95

MASS STORAGE

REVIEWS OF
HOLMES WAFER
TANDY DISK/VIDEO

AUTO ADDRESS
DIALER

LDOS GIVES 100
DISK DRIVES

BETTER BASIC
WRAP-UP

TAX PROGRAMS
REVIEWED

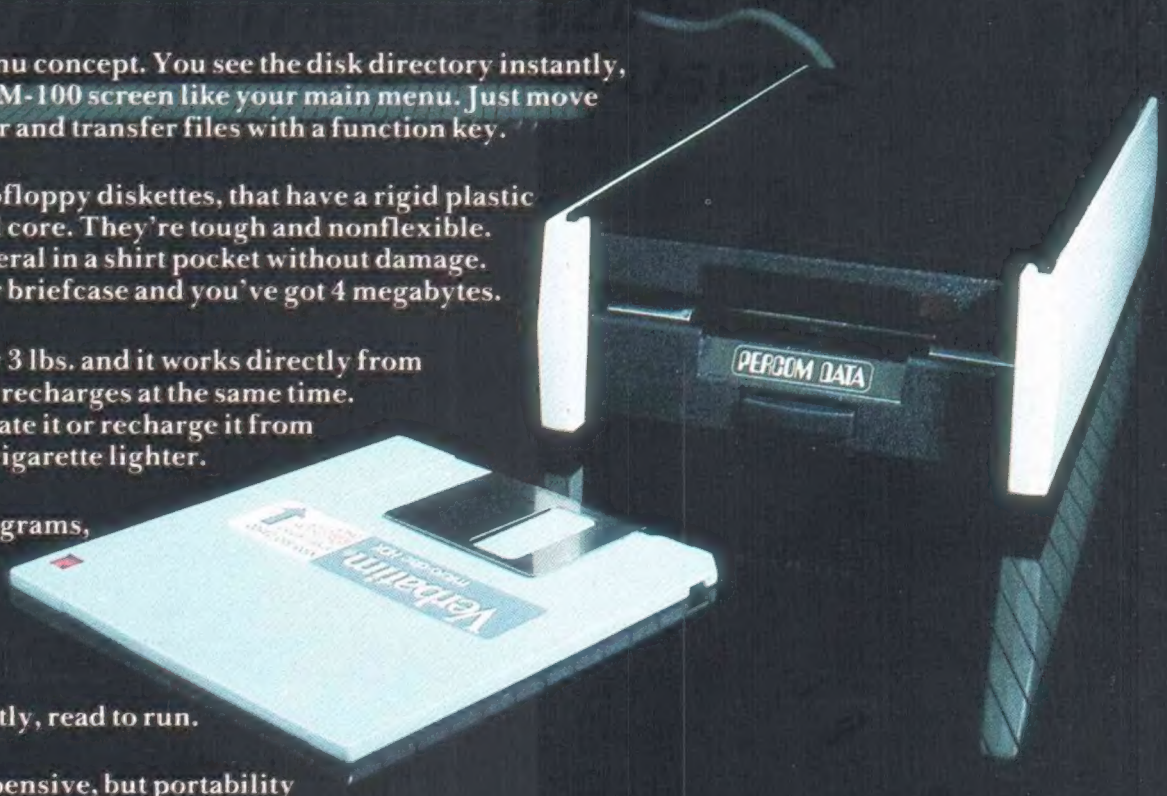
0 71486 02601 05

400K ON A SINGLE SIDE... RECHARGES IN ONE HOUR, THOUSANDS OF PAGES TRANSFERRED BETWEEN CHARGES.

Uses the main menu concept. You see the disk directory instantly, arranged on your M-100 screen like your main menu. Just move the widebar cursor and transfer files with a function key.

Uses SONY microfloppy diskettes, that have a rigid plastic casing and a metal core. They're tough and nonflexible. You can carry several in a shirt pocket without damage. 10 of these in your briefcase and you've got 4 megabytes.

Drive weighs only 3 lbs. and it works directly from the 110 outlet and recharges at the same time. Also you can operate it or recharge it from your automobile cigarette lighter.



Machine code programs, BASIC programs and documents all are saved and retrieved with no protocol — instantly, read to run.

Sounds a little expensive, but portability in a disk drive is an engineering feat. It's worth the money to have the power and freedom that this Portable Disk Drive can bring you.

Portable Disk Drive

FOR THE MODEL 100

$799.00

VISA/MASTERCARD/COD

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

13 with software for the Model 100

CALL 1-214-351-0564

Manufactured by PERCOM Data Corporation. ROM based operating system and access software by Portable Computer Support Group. Mastercard/Visa COD

Special Announcement

MODEL 100 128K BUBBLE MEMORY MODULE

Soundsight is proud to announce its new 128K *bubble memory module for the Model 100!* **The module is available in two models**, allowing it to be either attached to the *bottom of the Model 100, increasing it's overall thickness by approximately half an inch (Model 128X)*, or set up remotely, *along side the 100 in a small package* approximately 4" x 4" x 2", requiring the use of a cable (Model 128R). Both AC and DC operation is provided, requiring only a small 12 volt adapter. Rechargeable batteries are also compatable. The memory will be expandable to one megabyte (one million bytes of memory) through the purchase of additional modules, requiring factory installation (Model 128X), or reconfiguration (Model 128R).

This bubble memory module has a non-volatile memory which means the memory will not be lost in the event of loss of power or dead batteries. It can operate like a hard disk in which vast amounts of data or programs may be quickly stored, downloaded, and then run in the Model 100's 32k RAM. Upon downloading to RAM, the data is not erased from the bubble memory. With the use of simple sub-routines, programs which exceed the Model 100's RAM may be made to operate by sampling between the 100 and the bubble. No more I/O errors or cassettes or disks that won't read, and no more address or note files which take up the majority of RAM preventing the storage of other programs and requiring tedious cassette or disk procedures.

Power consumption is low because the bubble memory is powered up only when it "reads" or "writes" and it performs these functions in less than a second.

Originally developed by Soundsight for **Stevie Wonder's Model 100**, this module is especially useful to *reporters, programmers* needing remote terminals, or *anyone finding that they need more memory* in order to take full advantage of their investment in the Model 100 and all the software they may have bought but cannot use due to lack of memory.

The two models differ in price and features. The Model 128R sells for $750.00, while the bottom attachment — Model 128X, sells for $950.00. The 128X series allows space for the interfacing of additional 128k memory modules and their power requirements.

As certain programming is necessary for operation of the bubble memory module with the Model 100, the software driver sells for $100.00.

To order, send check or money order payable to Soundsight Communications.

Soundsight

2807 Pelham Pl., Hollywood, CA 90668
(213) 463-1519

Circle No. 2 on Reader Service Card

page 32

PORTABLE 100

MAY 1984
VOL.2 NO.5

DEPARTMENTS

4 PREVIEW

7 MAIL.100

14 THE WIRE

54 REVIEWS

67 NEW PRODUCTS

73 FULL DUPLEX
By Terry Kepner

76 BOOKS

Cover Photo by Charlie Freiberg

COLUMNS

26 TELECOMPUTING
Get on line and be on top with Altertext.
By Bill Louden

20 PORTABLE COMMANDER
Interrupt routine faster than bullet, more complex than mosaic.
By Jake Commander

22 BUSCH LEAGUE
Teaching your 100 to build a program generator.
By David Busch

30 TANDYTALK
What will the future lap-sized portable be like?
By Bill Walters

FEATURES

32
TRADING PORTABILITY FOR DESKTOP IMAGE
By John P. Mello, Jr.
When Tandy released the 100, a cry arose for more storage and a CRT display. Fort Worth's responded with a disk-video interface.

38
HOLMES DRIVE: IS RELIABILITY AND RIGHT PRICE ENOUGH?
By John P. Mello, Jr.
After surmounting production problems, the wafer drive arrives on the scene.

ARTICLES

45
BENDER'S BETTER WAY TO BETTER BASIC – PART 4
By J. Gary Bender
In Gary's final installment, he discusses branching statements and sorting.

page 38

PORTABLE 100 is published monthly by Computer Communications Inc., 67 Elm St., Camden, ME 04843. James S. Povec–President, Carl Cramer–Vice President. **ISSN. 0738-7016**

Subscriptions are $28 for twelve issues. User Group subscription rates available. Outside U.S.A.: write for further information. Dealer inquiries: Send to P100, 67 Elm St., Camden, ME 04843.

POSTMASTER: Please send changes of address to Portable 100, P.O. Box 250, Camden, ME 04843. Application for mailing at second class rates pending at Camden, Maine, and additional mailing offices.

Circle No. 3 on Reader Service Card

TRAVELING SOFTWARE.

FOR PEOPLE WHO ARE GOING PLACES.

TRAVELING SOFTWARE, INC. is a leader in providing innovative, efficient, easy-to-use software products for notebook-briefcase size computers.

If you are thinking of purchasing a notebook or briefcase size computer, ask your dealer if Traveling Software is available for it, or call our Consumer Support Division at: (206) 367-8090. Visa, Mastercard, COD orders only 1-800-227-3800, extension 233. 24 hrs., 7 days/wk.

THE BUSINESS MANAGER SERIES

- The Traveling Appointment Manager™ $59.95
- The Traveling Expense Manager™ $59.95
- The Traveling Time Manager™ $59.95
- The Traveling Sales Manager™ $59.95
- The Traveling Project Manager™ $59.95
- The Traveling Accountant™ $59.95
- The Traveling Tax Manager™ $59.95
- The Traveling Communicator™ $59.95
- The Traveling Writer™ $49.95

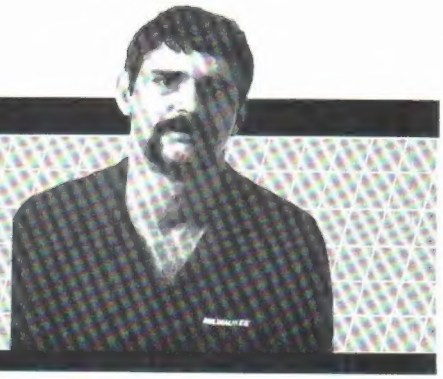
TRAVELING SOFTWARE™

TRAVELING SOFTWARE, INC.
11050 FIFTH AVENUE NE
SEATTLE, WASHINGTON 98125
(206) 367-8090

"FOR PEOPLE WHO ARE GOING PLACES"™

JOHN P. MELLO JR.

PREVIEW



AN ANSWER TO THE QUERY: WHEN WILL YOU COVER NEC AND OTHER RELEVANT TOPICS

Peter Montross, my affable advertising director, tells me inquiries have increased about *Portable 100* supporting the 100's fraternal twins — the NEC 8201A and Olivetti M-10. As you might have noticed, several of our advertisers support the three machines.

My feeling is *Portable 100's raison d'etre* is the Model 100. The magazine will be covering the 100's twin sisters, but its focus must remain the MEWS.

Will this change? Possibly. But machine-specific magazines like *Portable 100* depend on a micro's user base for support. And unless there are enough machines out there (or unless there is the *potential* for enough machines out there), a machine isn't going to get magazine support.

I hope, though, NEC and Olivetti owners don't feel orphaned. While *Portable 100* can't devote the space to NEC and Olivetti it devotes to the 100, there's room in its pages for more information on these machines, so we welcome submissions from twin-sister owners.

"Olivetti?" some of you may be asking. Yes, Olivetti announced its plans to market a Model-100-type machine in the United States (it's already doing it in Canada). Next month, *Portable 100* will be reviewing the M-10.

MEA CULPA. But before I get ahead of myself, let me back up a bit. By now you've all discovered some strange code in Jesse Bob Overholt's data-base article (April 1984, page 38). I won't go into detail about how the phantom code burrowed into my 100 while I "pretty" printed JBO's listing. Suffice it to say, if you trash lines 1 to 9, everything will be fine.

On a similar note, Charles Wright of San Ysidro, CA, notes a screen formatting error in Jonathan Erickson's and Robert Sayer's travel expense program (February 1984, page 28). In line 2240, change PP(9) = 230 to PP(9) = 234.

While I'm still in the embarrassment department, the many phone calls I've received about Bill Templeton's article on interfacing microcassette recorders with the 100 have made me feel like the captain of the S.S. Big Bun. However, not-so-gentle readers, I guarantee the article will appear in next month's issue.

MARY JEANN. The deadline for filing federal tax returns has passed, but it isn't too late to plan for next year. Two programs to turn your 100 into a tax aid are evaluated by *Portable 100's* latest addition to its stable of reviewers, Mary Jeann Batham.

Mary Jeann hails from Des Planes, IL. She has a MBA from Loyola University in Chicago and an undergraduate degree in journalism from the University of Iowa. Mary Jeann, who owns a business specializing in marketing Caribbean resorts, says *Portable 100* asked her to review the tax programs at an opportune time. She was so busy doing everyone else's taxes, she says, she had forgotten to do her own.

MASS STORAGE. Two significant additions to the Model 100's repetoire of peripherals have been the Tandy disk-video interface and the Holmes wafer drive. It's amazing to see keystrokes on the 100 displayed in 80- and 40-column green phosphor; to hear the whir of a disk drive and know your 100 controls it; and to feel the peace of mind that comes with a reliable save.

Granted, these are satisfying experiences, but are they for every 100 owner? I don't think so. See what I mean starting on page 33.

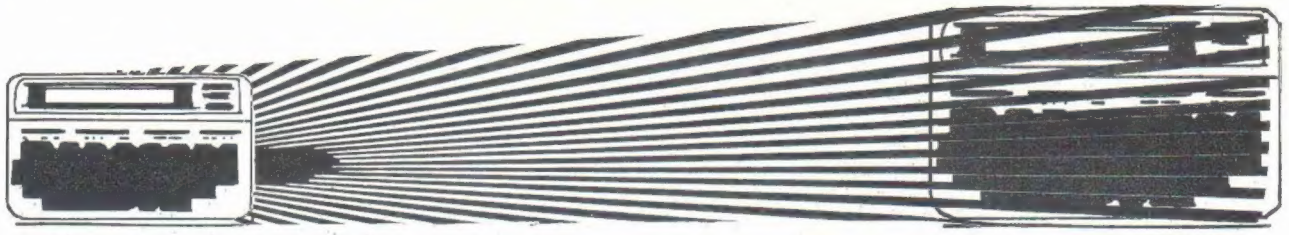
STARTS AND FINISHES. Dave Busch (page 22) begins a series of columns this month on creating a program generator. Program generator? You've heard about those things. They write programs for you automatically.

Dave's adapted his series of columns from a program-generating book he's written for the TRS–80 Models I/III/4. Each installment explains a facet of the generator and provides a useful program to illustrate how the article's principles work. That program this month is a good one for writers: a word counter.

Two series finish up this month. Jake Commander (page 20) wraps up his series on how interrupts work. And Gary Bender (page 45) finishes his series on better Basic programing. Gary's article includes a sort program.

BEST OF THE REST. Considering the number of computer publications published each month, reading can become a second full-time job. "Each month," writes Bill Louden, "I found it impossible to faithfully read or even scan the more than 200 computer and electronics magazines currently published and always worried about missing a pertinent topic somewhere."

What does an infophiliac like Bill do about information anxiety? He reads Altertext on CompuServe. What is Altertext? Find out in Bill's Telecomputing column starting on page 26.◀



MODEL 100-32K CMOS EXPANSION RAM
ITS LIKE HAVING MORE THAN ONE 32K, MODEL 100 AT ONE KEYBOARD!

— EXPAND YOUR (8K, 16K, 24K, or 32K) MODEL 100 to an additional 32K.

— STORE TWO 32K PROGRAMS without having to reload.

— EACH 32K IS BANK SELECTABLE with a single line **BASIC** program (programs may not transfer information between banks).

— The APPLICATION PROGRAMS already in your Model 100 (BASIC, TEXT, TELECOM, ADDRSS, SCHEDL) may be used in either bank.

— THE EXPANSION RAM MAINTAINS ITS OWN MENU of the data stored in it.

— Self-contained BATTERY BACKUP POWER

— LOW POWER **CMOS** DESIGN, enhances battery life.

— GO BEYOND THE MEMORY RANGE by installing additional 32K modules without losing the data on the first 32K module.

— EASY INSTALLATION! Installs into the expansion bus in the bottom of the Model 100 — Then concealed once the cover is reinstalled.

— HIGH QUALITY MANUFACTURING and WARRANTY.

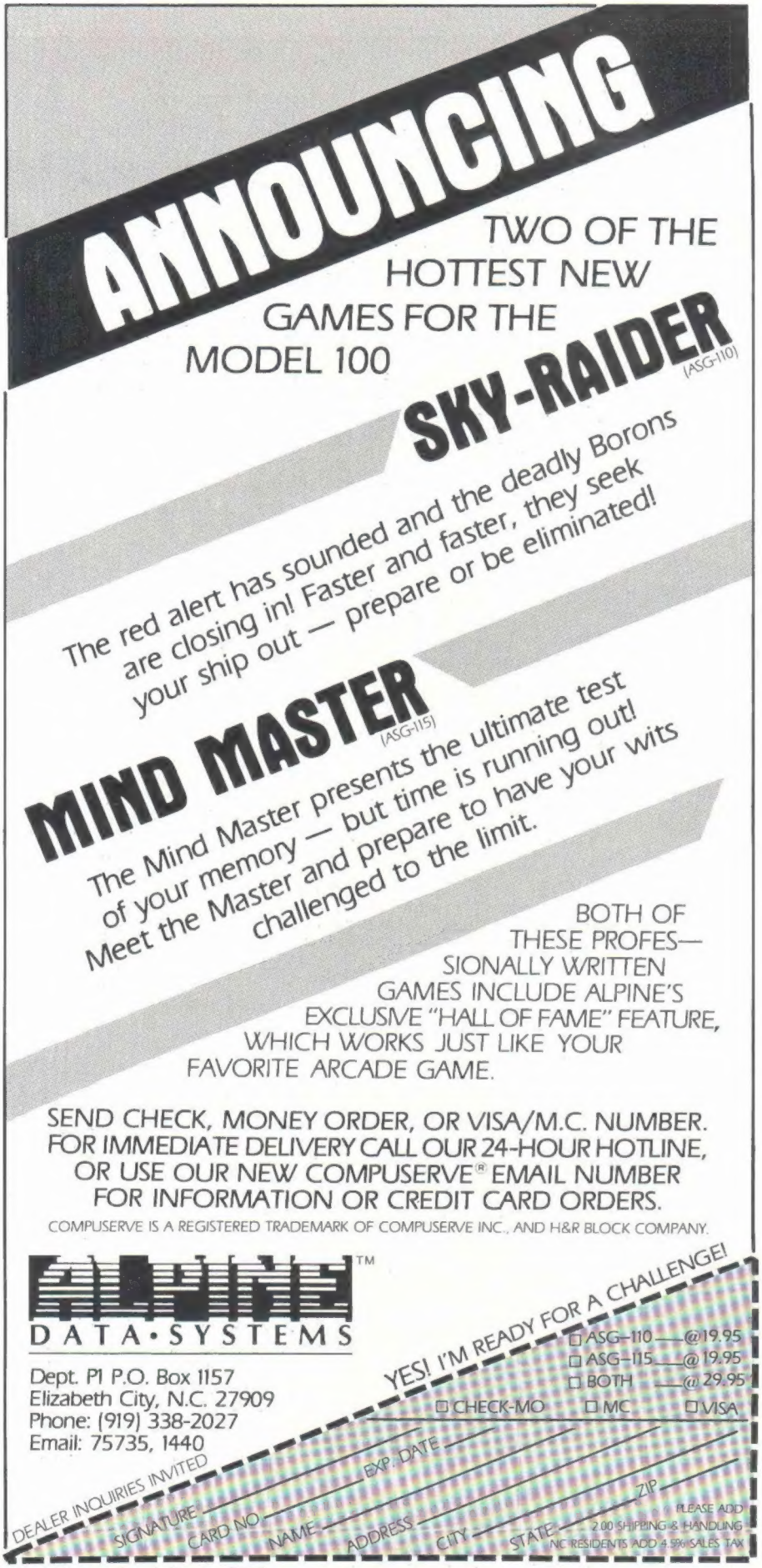
— List 325.00 (Just one third the cost of an additional Model 100.)

P.G.
DESIGN
ELECTRONICS

66040 GRATIOT, RICHMOND, MICH. 48062 (313) 727-2744

NO WARRENTY ON BATTERIES TRS-80 TRADE MARK RADIO SHACK
DEALER INQUIRIES INVITED

Circle No. 58 on Reader Service Card



Circle No. 5 on Reader Service Card

PORTABLE 100
The magazine for Model 100 users

Editor
John P. Mello Jr.

Assistant to the Editor
Nancy L. Laite

Contributing Editors
Jake Commander, David Busch
Terry Kepner, Bill Louden
Bill Walters

Art Director
Marjorie Strauss

Production Consultants
Paige Garland Parker
Lynn Rognsvoog

Publisher
James S. Povec

Associate Publisher
Carl Cramer

Advertising Director
Peter K.J. Montross
(207) 236-4365
P.O. Box 250, 67 Elm Street
Camden, Maine 04843

Office Manager
Kathi Colbert

©Computer Communications, Inc., 1984. All rights reserved. Contents of this magazine may not be reproduced in whole or in part unless expressly authorized in writing by the Publisher. TRS-80 and Model 100 are trademarks of the Radio Shack Division of Tandy Corporation.

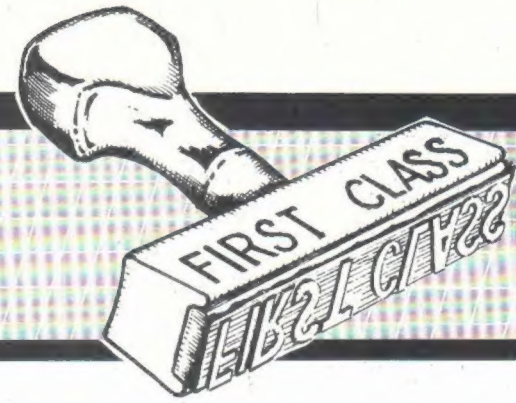
This magazine is published by Computer Communications, Inc. who is solely responsible for its contents.

The Publisher assumes no responsibility for the return of unsolicited manuscripts, queries or artwork. Materials submitted to Portable 100 should be accompanied by a stamped, self-addressed envelope. Editorial offices located at 67 Elm St., Camden, ME 04843.

U.S.A. Newsstand distribution by Curtis Circulation Company.

CIS ID: 76703,372

MAIL.100



Editor's Note: In addition to letters from our readers, we also include in Mail.100 letters from CompuServe and The Source. Those message writers are identified by their CompuServe (CIS ID) or Source (STC ID) identification numbers.

OP-AMP FOR MICRO CLOAD

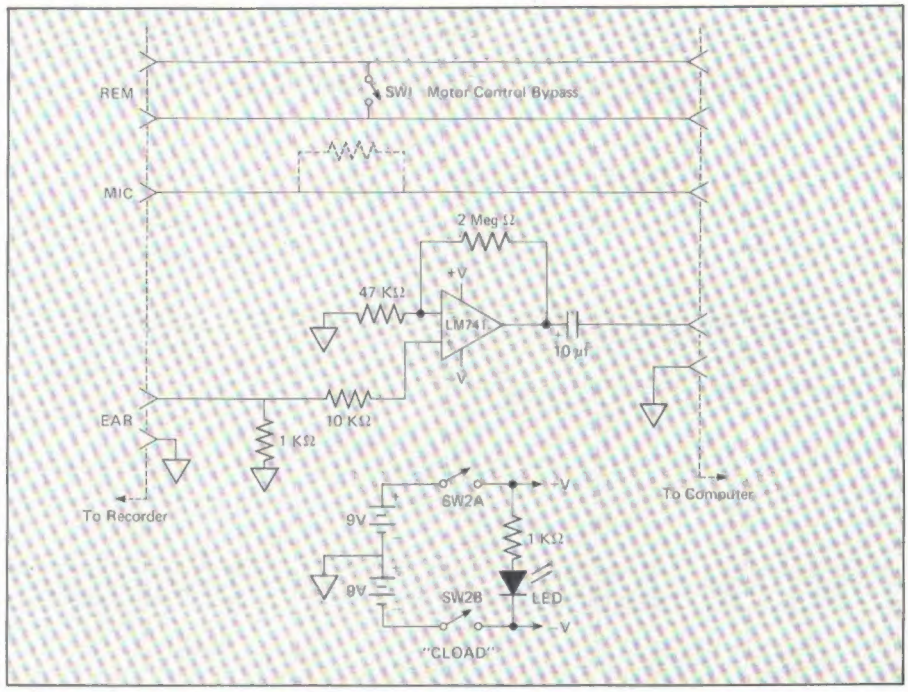
A frequent traveler, I find the large size of the standard Radio Shack data recorder inconvenient to carry with me and for that reason, I wanted to find a microcassette recorder. The result: General Electric's 3-5338 for approximately $70.

One problem: the output level is too low for the 100 to accept it. My measurements show the 100 will load tapes with perfect reliability if the input voltage from the recorder is around 1 volt (AC RMS). That high level can't be achieved from a cassette recorder only powered by two AA batteries, hence it was necessary to boost the output level.

The LM741 op-amp (see schematic) was the key. Although bulky due to its two-nine volt batteries, it's quite portable and near perfect for program-document retrieval.

I've had no success in developing a circuit which the 100 will listen to and will run off one supply (6 volts). Has anyone come up with a successful single supply-conditioning circuit?

Will Waterman
Jamestown, RI



VENTRILOQUIST CITES DUMMIES

I'm the ventriloquist-puppeteer performing in the touring Broadway show, "Sugar Babies," presently playing in Los Angeles. I have a 100 that I use primarily as a text editor when drafting comedy scripts and writing letters.

My subscription to *Portable 100* has enhanced my enjoyment with the 100. It's a first class publication that helps me learn more about my machine, especially through the programming articles and software reviews.

Why is it the hardcore hackers want to throw out games and anything "fundamental" and make the magazine more hackish? These dummies are overlooking other magazine subscribers and non-business people like me. *Portable 100* presents a lot for us novice 100 addicts, please don't stop!

Ronn Lucas
Greenbrae, CA

RX-80 ADDITIONS

I enjoy your magazine! The article in the October 1983 issue about Printer Control Codes by Thomas E. Graves has been my bible for getting the most from my printers with the 100. Here are a couple of additions that work on the RX-80:

- Form Feed — <GRPH>' works every time.
- Underline — <GRPH>k followed by −1 to start; follow by −0 to stop.

Bob Schwartz
Waseca, MN

AD INFO WANTED DOWN UNDER

Although not a 100 owner (my company has supplied me with an Olivetti M10) I've filled out your readers service card. There's more information I'd like from *Portable 100* advertisers and would appreciate it if you'd advise your companies of the following:

a) I require these products to be compatible with the Olivetti M10 without modification;

b) I'd like to know if any of these companies accept American Express cards;

c) I'd appreciate, in the case of software, a copy of report printouts. At this distance, this is often the easiest way to evaluate the value of a product.

Circle No. 6 on Reader Service Card

THE MSTRAP™

MAKES YOUR MODEL 100 EASY TO CARRY

The MSTRAP provides the Model 100 user with a convenient way to hand or shoulder carry their Model 100. Conversion from hand to shoulder carry and back again takes only a few seconds.
Installation of the MSTRAP will not void any of Tandy's warranties and can be performed by the purchaser in just a few minutes.
The MSTRAP comes with full instructions and has a lifetime guarantee.

ONLY $12.00
POSTAGE & HANDLING INCLUDED

THE DONALD STEPHENS COMPANY
M100 Model
Hardware & Software
1962 Pommel Avenue
Las Vegas, Nevada 89119
(702) 739-6113

PROP LEGS

- Elevate your Model 100 to the proper angle for use
- Slip easily into rear screw holes in case
- Snug fit
- Non-skid rubber feet
- Durable plastic legs
- Handy — your Prop Legs fit in your pocket!
- Only $5.00/pair

Includes shipping, handling, & CT residents sales tax.

Send check or money order to:

KJM Development
P.O. Box 698, W. Hartford, CT 06107
DEALER INQUIRIES INVITED

Circle No. 7 on Reader Service Card

d) I need to know prices, including airmail postage to Australia.

Stephen Lake
Glen Iris, Australia

▶ Glad to have you aboard as a *Portable 100* reader, Stephen. In regard to your requests, please keep in mind the high cost for advertisers to respond to reader requests. Often they respond to readers who've circled the least number of items on the bingo cards; they consider them to be more serious sales leads. Each advertiser responds the way he determines to be most cost efficient. Sending information packages to Australia is an expense I'm afraid some marketers will avoid.

We've published your letter so that all of our advertisers will know of your requests.

Peter Montross
Advertising Director
Portable 100

PUZZLED NO MORE

You're doing a great job for us 100 owners. I hope you keep up the good work. I'd especially like to see more utility programs (sort, file manipulation, etc.). A good disassembly or extensive memory map would be greatly appreciated too.

Is the jigsaw puzzle on page 40, December 1983 issue, Jake Commander's article, available for purchase? It'd make a great conversation piece once assembled and framed. It'd also serve as proof to the doubting Thomases (and Thomasinas) that the 100 does have feet.

Richard McLaughlin
Battle Creek, MI

▶ As a gift to you from *Portable 100*, the original jigsaw puzzle from the December 1983 issue will be sent to you with our compliments. Fair warning though, you'll have to put all the pieces together!

—*Eds.*

WRITE+ REVIEW UNDERSTATED

Thank you for the favorable review of Write+ in the March 1984 issue. Let me comment on a couple of the points author Dan Shafer made.

- Write+ does support embedded comments, using the command: .' text of comment. This displays on the screen when it occurs in a file, and it's not printed. This feature isn't documented since we couldn't think of a use for it.
- Pseudo spooling: Dan seemed to think it was a unique feature of another product that it could output to a RAM file. Write+ always has been able to do this.
- Size: Dan doesn't mention size. It isn't difficult to write a text formatter. But a small, fast one is another matter. No other word-processing program comes close to Write+ in terms of power-size ratio. Write+ is less than 3.5K.
- Pause printing: Any function of the 100 can be suspended by pressing the pause key; Write+ is no exception. Pressing pause a second time resumes printing where the user left off. People may be confused about this since Write+ finishes the line it's printing before pausing.
- Global printer commands: We haven't had any problems with this in the past. If Dan had called our hotline, we could have helped him track down this problem. While on that subject, our release of Write+ for the NEC PC8201A has an enhanced and simplified method of embedding printer commands. It also satisfies Dan's "final complaint," by permitting indentation of a line into the margin.
- Documentation: Although Dan's comments were favorable, they were rather low-keyed compared to what we usually hear. We're particularly proud of our documentaton. It might not be the type of deathless prose an English major would salivate over, but the fact it's, in Dan's words, "easy to follow, well-designed, and thorough" surely is enough to set it above 95 percent of the documentation mainstream.

Michael Stanford
Portable Computer Support Group
Dallas, TX

TO KEEP THE HONEST HONEST

Thank you for the opportunity to reply to Rush Caley's letter which appeared in the April 1984 issue of *Portable 100* and commented on Code Keeper.

Code Keeper is designed for serveral purposes, and I feel it does them quite well, within the limits of the hardware.

Code Keeper is advertised as a software padlock for the 100 to keep un-

AT LAST!
AN INEXPENSIVE SPREAD SHEET FOR THE MODEL 100

$29.95

If you are tired of using a pencil and paper next to your Model 100 just to do the simplest of calculations, then Datamasters has the answer.

ESS-2.2, an Electronic Spread Sheet program, will do almost anything you desire in the way of forecasting and planning calculations. Designed around the unique memory handling capabilities of the Model 100, **ESS-2.2** data and format files can be saved and retrieved without the use of peripherals, while formatted hard copies of spread sheets may be made using a single function key.

Datamasters wants to continue to supply you with the latest and lowest priced business and entertainment software for your Model 100. Any suggestions or comments you may have will be greatly appreciated. See mailing address on coupon at right. Thank you.

Circle No. 8 on Reader Service Card

DATAMASTERS
P.O. Box 3560, San Luis Obispo, CA 93403

Qty.

_____ 24K version of Electronic Spread Sheet 2.2 • $29.95
_____ 8K version of Electronic Spread Sheet 2.2 • $29.95
_____ PTERODACTYL – A Fun Game of an invading bird creature • $9.95

Add $1.50 for postage and handling. California residents add 6% sales tax.
For fastest delivery, send Cashier's Check or Money Order. Personal checks – allow three weeks to clear

_____ Amount enclosed.

Name _____

Address _____

City _____ State _____ Zip _____

What other types of software would you like to see made available for the Model 100?

_____

_____

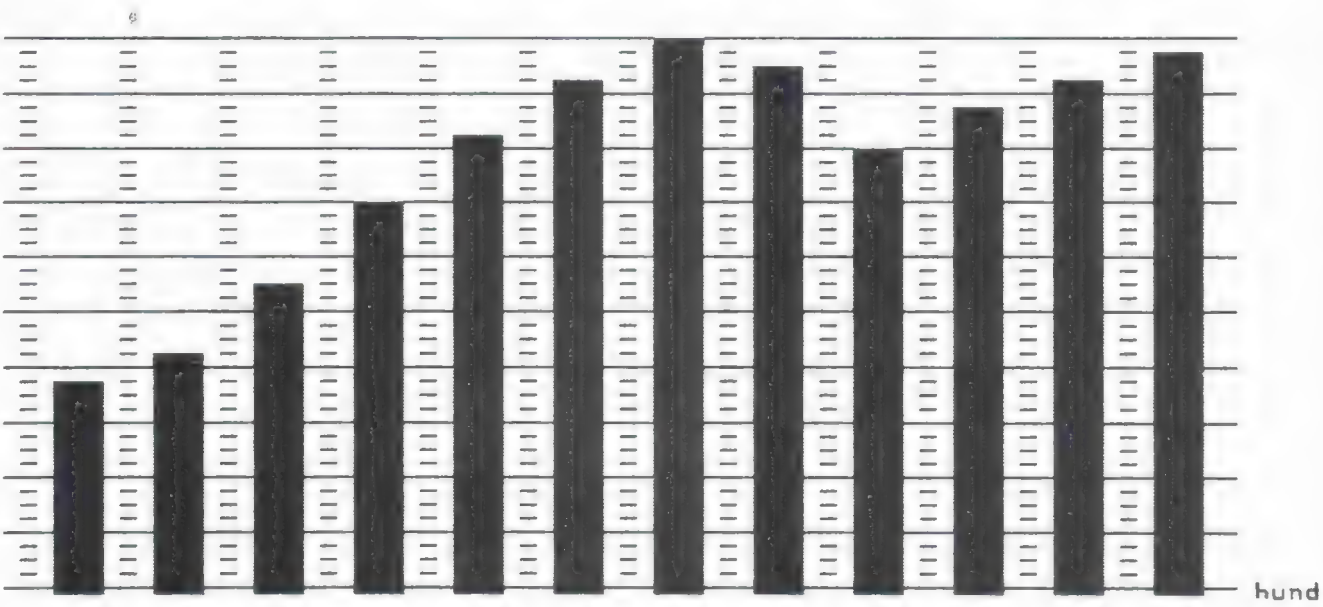
MICROBYTE INTRODUCES

POWERFUL BUSINESS AND HOME SOFTWARE AT MICRO COST FOR THE MODEL 100

DATA 1

DATA 1 A data management system written specifically for the Model 100. It's features along with the 100's built in features combine to make this the most powerful Model 100 program to date.
DATA 1 is designed to allow you to set up files to store, retrieve, update, sort, and print data in a format created by you.
DATA 1 is ideal for a large variety of business and home uses such as tracking progress, income, expences, mailing lists, home budgets, and numerous others.
DATA 1 is easy to operate and like all MICROBYTE software is priced to reduce the high cost of quality programs.

SOFTWARE SALES VOLUME 1983



GRAPH1 uses keyboard to enter heading and accepts numbers either from keyboard entry or direct from DATA 1 files
GRAPH1 Screen display of line graph and bar graph, prints bar graph either narrow or wide on dot matrix printer for standard or 132 coulmn paper.
GRAPH1 will graph an individual record from a DATA 1 file or sort first then graph the totals.
GRAPH1 is excellent for graphing production, income, expences, sales and much more.

Both programs are supplied on cassette tape and come with easy to understand manual.

DATA1 $49.95 GRAPH1 $19.95 BOTH $65.00 CHECK, C.O.D., MASTERCARD, VISA

MICROBYTE 602-943 9080
11047 N.19th Ave., Phoenix, AZ, 85029

Circle No. 9 on Reader Service Card

authorized people from accessing files within the computer. We compare it to a lock on a car, home, or office door. Nothing is foolproof if the intruder has enough knowledge and the correct tools.

This is what I meant when I spoke to Mr. Caley on the phone. It'll keep out a fellow office worker, one's children, or a hotel maid. To quote Caley: "Code Keeper will keep out all but the seasoned hacker."

It originally was written for use in my computer and I feel safe with it installed. I realize an avid hacker will find a way around it or could just cold reset the memory and presto it's gone. But isn't this the same as a vandal's ability to hot wire a car or a burglar's ability to get into a alarm-protected home?

I find objection with Caley's statement the software is overpriced at $25. When one figures the cost of the documentation, packaging and shipping, phone calls, time spent with customers, and bank credit cards, a large profit is not being made.

Mr. Caley isn't being very security conscious nor is he doing other 100 owners a favor by spelling out in his letter how the computer's security can be defeated. However, we've made changes in the program and will gladly update programs already sold (before 1/20/84) at no charge other than $2 to cover cost of repackaging and shipping. Just return the original cassette to us.

With this mod, we suggest the program be run before the unit's turned off, then it won't IPL and the weak spot Caley refers to won't present itself each cycle as it does now.

If others feel they need more security than a software padlock can offer, there's a good free program available on CompuServe that'll encrypt files. This along with Code Keeper will make the 100 as secure as any method I'm aware of.

Bob Sherman
Sherman Electronics
Miami, FL

100 POSSIBLE REHAB TOOL

Solution wanted! I'm the victim of a broken neck which left me a C-5 quadriplegic with limited use of my left arm only. Since I'd like to aid others with similar severe physical disabilities through rehabilitation, my attendant and I are managing an independent living transition home.

We want to provide a conducive environment for our residents, and that requires computerizing the operaton. Santa Cruz Easter Seals Society has opened an account to receive tax-exempt donations or equipment for this process. But I'd like to expand this fund, which is in my name, to a fund that encompasses all severly disabled.

The campaign struck the interest of a design engineer who loaned me a 100 to help design my work station. I type and turn pages with a mouthstick and in order to free my reading space, a standing case was made. This later was mounted on my wheelchair (see photo). The next step is to construct a mount for the memory cassette.

I'm not sure which machine will be the best for me. Portability is a definite plus, and I like the 100. But I also want control, graph, code, and right shift keys that lock like the caps lock and number keys. I'm told it's not possible.

And yet, I can't help but think someone can figure out something. This would greatly increase my ability to word process and other two-key functions. Such a solution would make the 100 a strong candidate for the pool of loaner machines I have in mind.

John R. Grammer
Corralitos, CA

TCM-7 NOT TCM-600

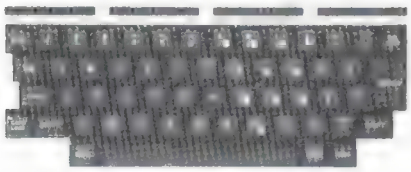
In my original letter, which appeared in the April 1984 issue, I wrote re-

John R. Grammer. *Locks on control, graph, code would help.*

From the people
who brought you...

BUSINESSPAK+

each on its own cassette with interesting manual...



MORE EXCELLENT PROGRAMS FROM PCSG . . .

You have made BUSINESSPAK+ an overwhelming success! Now, we are introducing **five new programs** for the Model 100.

PCSG continues to be first in innovative programming for the businessperson using the TRS-80 Model 100 Computer.

Look at these five new programs.

DATA+ **$59.95**
With DATA+ the Model 100 becomes virtually a true data base. You can input data rapidly from a 16 field screen that you make yourself like our PUT+. Here is the difference.
REVIEW / Using function key 1 you can recall any record, by searching any field.

EDIT / Change or update any record you select, instantly on the screen.

LIST / Using function key 5 you can print address labels, list records or selected fields of records in columns or other configurations. You can even pause, and reset left margins.

MERGE / Function key 6 lets you merge. You can automatically print any fields of any records into forms or letters, wherever you designate. With all four of these functions you have full search and selection capability.

With LIST and **MERGE** DATA+ remembers your favorite formats, quickly defaulting to them by simply pressing the **ENTER** key. The added feature **BUILD** lets you build and print a file of unrelated records that could not be selected either alphabetically or numerically.

On cassette with excellent, easy to understand manual.

TYPE+ **$59.95**
(part of the BUSINESSPAK II. Six programs for **$89.95**, see ad page 29)

You will never use TEXT to originate a document again. The Model 100 now becomes, with the addition of any printer, the finest, most feature rich, electronic typewriter available today. You can type directly to the paper. (some printers have a one line buffer)

Underlines, and does bold-face print on any printer with function keys (no control codes to look up or embed). Right justifies at the touch of a function key.

SCREEN BUFFER / To allow you to edit before printing, you can control the screen buffer from 1 character to the last line.

CENTER / Center on / center off controlled with function keys.

MARGINS / Set margins with function keys. Audible end of carriage, automatic carriage return and function key Tab Set.

DIRECT CONTROL / If your printer responds to backspace commands, you can backspace and overstrike. Paper advances with carriage return.

With TYPE+, everything you print is stored simultaneously in a RAM file, formatted as you composed it. You can reprint instantly, or edit it in the file. On cassette with excellent, easy to understand manual.

TUTOR+ **$39.95**
This is what we consider as the finest typing instruction program we have ever seen, on any computer. A person with no keyboard skills can be touch typing in three weeks.

Detailed manual as well constructed as any high school typing textbook. Program automatically feeds all 30 typing lessons and drills through, across the screen at graded speeds from right to left. You make letters disappear by typing them correctly.

After each lesson you are given a test. Upon completion you are scored for speed and accuracy. You can test at any time.

Also TUTOR+ has an exciting game mode. While experiencing the thrills of a space invaders type game you autumatically become proficient at manipulating the keyboard.

SORT2+ **$29.95**
You can sort a file in place with SORT2+. It consumes only 1k free memory, while sorting file in RAM you entered with PUT+ or DATA+. Our original SORT+ allows you to sort from cassette, but requires more memory while sorting. SORT2+ is for those times when memory or cassette sorting is a problem. SORT2+ also has upper case fold, and true numeric field sort. On cassette with excellent, easy to understand manual.

TENKY+ **$59.95**
With TENKY+ the numeric keypad on your Model 100 emulates both a ten-key desk calculator, and a financial calcultor. The right side of the screen represents the tape, which can also be directed to a file and/or a printer. Ten working registers are visible on the left of the screen, each one functioning independently as a calculator with functions including exponentiation and logarithims. Registers are accessible from each other, including the tape which stores up to 120 values, each associated with a note of up to 26 characters.

Financial functions available at the touch of a key include IRR, MIRR, and NPV on up to 120 cash flows, plus any of its five annuity variables (n, PV, FV, PMT, i). Function key F2 gives a printed amortization schedule, and businessmen will love the breakeven analysis they can receive simply by pressing function key F1.

PCSG provides hotline software support for the Model 100. Give us a call at 1-214-351-0564. MASTERCARD/VISA/COD.

Portable Computer Support Group is pleased to offer these program additions. We endeaver to continue as The Leaders in Software for the Model 100.

TRS-80 Model 100 is a trademark of Tandy Corporation © 1984 Portable Computer Support Group.

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

1st with software for the Model 100

Manufactured by PERCOM Data Corporation. ROM based operating system and access software by Portable Computer Support Group. Mastercard/Visa/COD. PCSG provides hotline software support for Model-100. Call 1-214-351-0564. Available now directly from Portable Computer Support Group. We endeavor to continue as The Leader in Software for the Model 100.

Circle No. 10 on Reader Service Card

garding my experiences using a small recorder with the 100. In that letter, I mentioned my Sony recorder, giving the model number as TCM-600. Please correct that; it's model number TCM-7.

Herbert F. Spirer
University of Connectitcut

TECH INFO NOT IRRELEVANT

In Mail.100, March 1984, Mr. Forrest L. Erlandson took you to task for having too much jargon and irrelevant articles. I'd like to respond to that in your defense.

Mr. Erlandson assumes most readers are like him, not interested in high-tech articles. I think he's failed to give credit to *Portable 100's* wide readership. As a leading publication dedicated to the Model 100, the magazine is obligated to provide as much information as possible about this new machine. Lack of internal documentation is one of the biggest problems when programming a new system.

This is the time to get this information out, during the early life of both the magazine and the machine. Articles like Jake Commander's ROM information are necessary so programmers can use it.

The small percentage of readers who really understand such articles are probably the greatest percentage of program developers. When they've the system information they need, we all benefit with more and better programs available for the 100.

Jargon is a relative term; once you understand what it means it becomes descriptive terminology. All fields have their own vocabulary. The magazine's acceptance of my four-part series on programming tools for Basic is indicative; the editor hasn't forgotten the "semi-novices."

Gary Bender
Los Alamos, NM

DON'T FIT IN

Inspired by your December 1983 story, "Ramp Up...to 32K...," page 34, I purchased an 8K expansion RAM from one of the sources listed in the article. I found it wouldn't fit because its lower end interfered with a capacitor. The company refunded my money when I sent it back.

I sent away for another 8K RAM; this time to a different company. Again, I couldn't fit it in the socket because the top edge interfered with a plug and a capacitor. I'm in the process of sending this one back!

Before I go to Radio Shack for another 8K, do you know of any RAM listed that promises to fit? (The RAMs tried so far are Purple Computing's and P.G. Design Electronics'.)

Oscar Firschein
Menlo Park, CA

▶ Oscar, you're the first person that's told us he or she was unable to make the simple installation of an 8K chip in his or her 100. We have installed Purple Computing's and P.G. Design's 8K chips without a problem. Scott Norman, who wrote the RAM upgrade article, has had similar success with chips from Iota Systems. Apparently, the "simple" upgrade isn't simple for your machine, however, so we recommend you take it to Radio Shack. ◀

Circle No. 11 on Reader Service Card

TRANSDOC™ MAKES YOUR MODEL 100™ NEC8201™ INTO

A SMART KEYBOARD FOR THE IBM PC™

AND MULTI-USER SYSTEMS

- SIMPLE TO USE: JUST HAVE YOUR SECRETARY PLUG IT IN AND SEE YOUR MODEL 100 TEXT DOCUMENTS APPEAR FULLY FORMATTED ON YOUR HOST COMPUTER MONITER SCREEN READY FOR RE-EDITING AND/OR DISK STORAGE
- NOT FILE — FILE TRANSFER
- WORKS WITH WORDSTAR™ OR YOUR FAVOIRTE WORD PROCESSOR SOFTWARE
- NO MORE RETYPING AND REFORMATTING MATERIAL PREVIOUSLY DRAFTED AT HOME OR IN THE ROAD
- PHONE TRANSMITTED DOCUMENTS AUTOMATICALLY REFORMATTED ON YOUR IBM PC OR OTHER HOST COMPUTER

NO SECONDARY PORT, NO NULL MODEM, NO SPECIAL COMMUNICATIONS REQUIRED ON YOUR IBM PC OR HOST COMPUTER.

$79.95 INCLUDES HARDWARE, CABLING, CASSETTE, & MANUAL

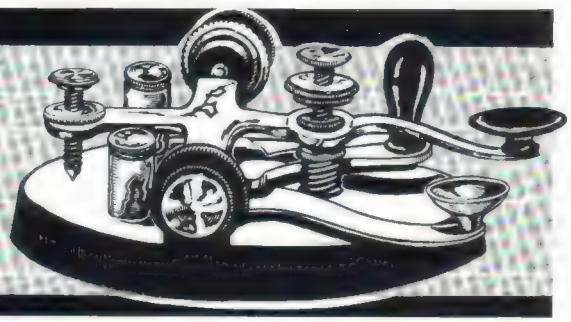
MasterCard **SOFTWARE PLUS** VISA

100 N. COUNTRY RD., SETAUKET, NY 11733

(516) 751-1565

TM TANDY CORP. TM NEC CORP. TM IBM CORP. TM MICRO PRO CORP.

THE WIRE



AIR 100

AIRLINES STILL IN DARK ABOUT MICROS IN FLIGHT

By CHERYL PETERSON

In an informal survey of some of the major airlines *Portable 100* discovered that — even a year after the Model 100's release stirred controversy about computing in flight — a general lack of knowledge on the subject still exists among air carriers.

American, Trans World, and United Airlines reservation clerks had an immediate answer available. American said, "No." The American clerk was under the impression a study had been done and the results were unfavorable for computer users.

The other two airlines approved: The TWA clerk referred the reporter conducting the survey to her dealer, claiming the dealer would know whether or not any particular computer would interfere with the airplane's navigation equipment. The United agent went so far as to assure computers were perfectly safe; there was no danger to the aircraft's navigation equipment.

Ticketing agents at other airlines had to get an answer from someone else.

For the moment, Piedmont is not allowing computer use in flight, according to spokesperson Patty Wallace. However, a safety study is being conducted. When the results are available, she imagined some announcement would be made.

Northwest Orient said the decision would be up to the flight crew. In general though, they usually allow them to be used in flight, but not during takeoffs and landings. If problems were detected, they would probably ask a passenger to refrain.

Republic had much the same response. Only if interference were detected would a passenger be asked to put the computer away. All carry-on baggage must be stowed during takeoffs and landings.

Portable 100 received two unqualified no's: Air Florida and Continental. Neither agent knew if plans had been made to investigate further.

The reservations clerk at Pan Am wasn't sure what company policy was. He referred the surveyor to Mike Clark, public relations director for the Southern United States, who said computer use was permitted inflight: "We never did ban them. We did a study early on. As soon as something like this develops, we get right on it." He also said their independent study showed computers were safe.

WHAT THE AIRLINES SAID

AIR FLORIDA	NO
AMERICAN	NO
CONTINENTAL	NO
DELTA	YES
NORTHWEST ORIENT	YES*
PAN AM	YES
PIEDMONT	NO
REPUBLIC	YES*
TWA	YES#
UNITED	YES

*Flight crew has final say.
#Ask computer dealer.

Marilyn Kucher, from Delta's public relations office, said they were allowing use on their flights: "We have conducted tests and our tests haven't found any indication that a battery-powered portable computer would cause interference to aircraft systems, including navigation and communications."

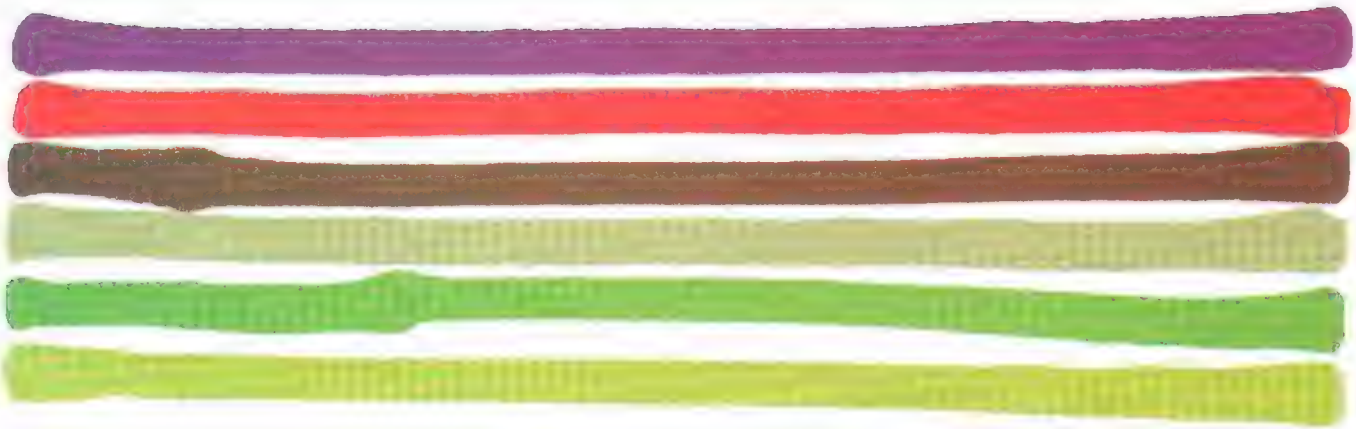
In a related matter, Eastern Airlines announced it will allow the use of portable lap-sized computers aboard its planes.

In a January 31 press release Eastern declared use would only be limited during takeoffs and landings, when the units would have to be stored like any other baggage, in the cabin area. This ruling is extended to other electronic equipment including: solid state calculators, heart pacemakers, hearing aids, electronic games, and portable recorders.

Felix Forestieri, the head of Corporate Communications for Latin America, said he was glad Eastern was able to find the computers don't interfere with navigation systems in their planes. Although as a personal computer user he well understands a passenger's desire to compute while commuting, "...we couldn't allow their use until we had assured ourselves that they would in no way interfere with the safe operation of the aircraft. Our tests have proven to us that they are safe," he said.

Interference tests conducted by United Airlines and the Ford Aerospace labs have also given the Model 100 a clean bill of health (*Portable 100, March 1984, page 17*).

Eastern will continue its ban on the use of walkie-talkies, portable telephones, radio and televison receivers, and radio-controlled toys.



DATACCOUNT

Unique software to make your lap-sized portable the equal of any desk-top microcomputer.

Professional and personal management programs designed for Tandy Model 100, NEC PC-8201, and Olivetti computers.

Dataccount's proprietary algorithms in assembly language give your computer virtual random access memory, accessing any record in less than a second, even in a 32K byte file. Other features include variable length fields, searching and sorting capabilities, with no memory overhead.

Now available from NEC dealers are four new programs by Dataccount; tax preparation, tax planning, timekeeping, and real estate analysis.

Applications now in use include:
- **Name, Address Data Base**
- **Appointments**
- **Text Formatting**
- **Calculator**
- **Real Estate Analysis**
- **Timekeeping**
- **Tax Preparation**
- **Tax Planning**
- **Games**

DATACCOUNT
516 S.E. Morrison, Suite 820
Portland, OR 97214
(503) 232-0490

Subscribe
1-800-225-5800
TODAY...
12 Issues
PORTABLE 100
only $24.97
CALL US!
IT'S FAST
& EASY!!
(or write)

PORTABLE 100 MAGAZINE
P.O. BOX 250, 67 ELM ST.
CAMDEN, MAINE 04843

Until an industry-wide regulation or directive is released, however, it'd be prudent for travelers to call the airline they plan to fly before they make their reservations. ◀

Cheryl Peterson is a freelance writer based in Miami, FL.

SOFTCON

LARGEST SOFTWARE SHOW TO DATE LACKS SIZZLE

By MIKE GREENLY

Editor's Note: Mike Greenly (Source ID STA 387) left his job as marketing Vice President for Avon Products, Inc. about six months ago. He launched Mike Greenly Marketing which does various kinds of consulting for large companies including Avon and Standard & Poor's, and for small, startup companies as well. He's especially interested, he says, in larger ones!

To get his business known, he became Planet Earth's first "interactive-electronic journalist," sending back reports from technology events like Comdex, the Consumer Electronic Show, and the launch of Apple's Macintosh — all via his Model 100 computer. His reports are read via the Participate service on The Source by readers as far away as London and Tel Aviv.

Here are some excerpts from his coverage of Softcon, held in New Orleans in February, to date, the industry's largest software-only conference.

I'm sitting on the plane headed south from NYC, clicking away on my Model 100. (I fly TWA a lot, because it has no problems with my using my 100 in flight.)

Just as I'm musing about the day — soon? — when I can send these reports from an airplane telephone, a silver-haired, urbane gentleman stops in the aisle by my seat.

"How do you like the Model 100?" he says. All he needs is a cape, like the chic "uptown" hypnotist. What specific details would I like changed about it, he wants to know. Then he gives me his cards — two of them — saying "You may have gotten more than you bargained for."

He's the (famous) Ben Rosen. Among other things known as the Chairman of Compaq (card 1) and Director of Lotus (card 2). Guess my trip is off to a good start!

Why would Ben Rosen want to know about the Model 100, hmmmm?

*****

It's Tuesday morning. I scoot past the bearded guy in the white sweater and take my seat. Now I begin typing my "you are there" reports.

Apple's Steve Jobs will give the keynote address. I'll be sending reports to Source readers only minutes after he stops. We're waiting, just shuffling and gabbing till the session begins.

Wait a minute! The stripes on that man's white sweater are Apple colors. And he's just been identified by the guy behind me as — Steve Wozniak!

Well I'm flunking the test of how cool I am — I've dealt with celebrities before, but I have to admit I'm really excited to be sitting right next to him. Now — just as I'm typing in comments about ambience — "The Woz" asks to try out the keyboard on the Model 100 (he likes it). He also likes the idea that it's furthering a new kind of electronic journalism. People "talking" to people.

*****

Steve Jobs' speech is very much a reprise of the material he covered at the shareholders' meeting for Macintosh. Except this time, the reception is much, much quieter. Why? I think it's just because these are dealers, journalists, and exhibitors — not employees and Apple shareholders. And partly because by now everybody's read so much about Macintosh — these people already know what he's telling them. And he could have been better at selecting material for this savvy trade audience.

His theme — aside from being a "commercial" for Macintosh — is the need to create much more ease in the use of computers and software. His message, I later discover, permeates all of Softcon. Everyone talks about how "easy" their offering is — even the ones you suspect of being willfully ironic.

*****

Afterward in the elevator, I play "Mike Greenly, Boy Journalist" asking everyone what they thought of the Jobs' keynote address.

Person A (president of his own software company): "I think he's playing right into IBM's game. He's talking about IBM so much it sounds like he's scared. He keeps making them seem like the leader."

Person B (after the first man's off the elevator): "Baloney! Steve Jobs has changed the way we live on this planet. That's what Macintosh means. His speech was outstanding."

*****

What is Softcon like? It's not like Comdex or CES, that's for sure. There aren't the same crowds. There are not the pornographic video people complaining to the press that their display booths stink. There's no gambling in the restaurants. No loud music at every turn.

It's all more spacious. More genteel. The main booths are all on the Superdome floor, with smaller ones high on the mezzanine up above and around us. Over us all is the Dome, the vastly higher-than-Vegas ceiling of this modern sports castle. Air, light, intelligence, opportunity.

But there's so little "hard news". Readers are waiting for big announcements, but nothing much is being launched — or sold. The arena below empty stadium seats is all too easy to stroll.

There's just no "sizzle".

People socialize in the aisles that weren't intended to be so empty. There are certainly fewer dealers here than exhibitors expected. The major new product announcements — Symphony from Lotus, the new portable from IBM — were publicized before the fair, not at it.

It's different.

M100 SMALL TALK

- Interface your M100 with the IBM PC or Commodore 64 using a null modem cable
- Send and retrieve files
- Use the screen, printer and disks on your IBM or Commodore
- $59.95 with null modem
  $39.95 without null modem

M100 DIAL TALK

- Interface your M100 with the IBM PC using your M100 modem
- Send and retrieve files
- Use the screen, printer and disks on your IBM
- IBM operates unattended with password access and event logging
- $59.95 single user license

NULL MODEM CABLES

- 5 feet long with metal hoods
- These will fit the M100
- $39.95 specify male/male or male/female

Send check or money order to:

Key Solutions, Inc.
19 Silvermine Road
New Canaan, CT 06840
(203) 966-9773

(Connecticut residents please add 7.5% sales tax)

IBM PC is a trademark of IBM Corporation. Commodore 64 is a trademark of Commodore Business Machines, Inc.

Circle No. 13 on Reader Service Card

Circle No. 14 on Reader Service Card

RPN Calculator
For the Model 100.

What is it? It's a RPN* calculator program. It's also a data input subroutine that can be used in your own programs.

- ***CALCULATOR PROGRAM***
  +, −, /, y^x, x^2, sqrt x, 1/x, x!, lnx, e^x, 10 memories with memory arithmetic — displays stack or memory registers
- ***DATA INPUT SUBROUTINE***
  Calculator hidden in cursor at any prompt you choose — instead of INPUT X use GOSUB 5048: X=AN fully transparent
- ***RPN TUTORIAL***
  Facilitates learning RPN (reverse polish notation) by observing stack in operation
  Help function included

Includes tape and instruction booklet.

To order send check or money order for **$19.95** to:

COMPUTE/ACCOUNT

P.O. Box 3304 • McLean, Virginia 22103-3304 • (703) 759-3838

Dealer Inquiries Welcome

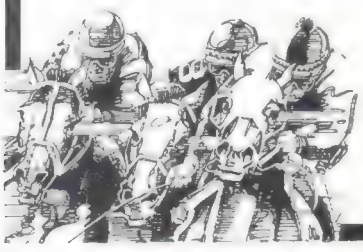
* RPN is a method of entering algebraic expressions into a calculator without the use of parentheses.

WRITE YOUR OWN PAYCHECK!

New Discovery Guarantees You'll Pocket Big Money, No Matter What "System" You Currently Use.

Big winners at the track are not 100 times smarter than you, but they probably are making 50 or even 100 times more money. Some even use the IDENTICAL "system" you've been using. How is it possible? Money Management! Over three years of research and six months of past results prove you can consistantly make large daily profits and it works independently of any handicapping system! You decide how much you want to make. $20/race for 9 races over 6 days would equal a minimum of $1,080. The model 100 automatically tells you what you need to do each race as it tracks your every move. What's more, the system can be used either at the track or your local OTB.

The plan comes complete with documentation for only $29.95.



CONSULTANT SUPPORT SERVICES. INC.
435 Main Street
Johnson City, NY 13790

Circle No. 15 on Reader Service Card

THE WIRE

Software, after all, is the brains *inside* the box. There's a different sense of "community" among these people who create or distribute it. Softcon's as separate from Comdex as lightweight "disks" are from "hardware".

Softcon, at least this first one, is like a party given for and by thousands. Not that many of the guests showed up, but all the cooks are having a nice time. (Except for some who were expecting — and needing — a lot more tasters.)

*****

I stand at the Softyme Booth — the electronic distributor — and watch pretty and poised Lorraine Mecca, the president of MicroD (a big software distributor) stand up on a coffee table in front of the small crowd. She announces her plans to join forces with Softyme to test sending software over special store phone wires (at 56,000 baud!).

I'm as impressed by Ms. Mecca as by her announcement. I interview her afterward to see how she feels being the only woman president of a major software distributor. (Five years ago she was a secretary — that's a remarkable change!)

I've noticed that here at Softcon there is a much higher number of women in exhibitor booths than was ever the case at CES or Comdex.

Women, as Lorraine Mecca points out, have a natural advantage they could capitalize on still more: "They're 'trained' to type," unlike most of their male counterparts.

On the other hand, some of the other women I interview here feel a great deal of consternation. "Way too many girls think of computers as boys' toys" several women tell me.

Softcon is evidence that the stereotype is changing, slow though the process seems.

*****

I'm a speaker at Softcon on the "effective advertising" panel. This gives me the chance to have breakfast and a chat with some knowledgeable people — the publisher of a major consumer magazine, the VP's of software, distribution, and research companies, and the president of an advertising agency.

While a harp plays in the background, I form these impressions from the conversation around the table (resembling a microscopic U.N.)

- The vast influence of IBM is clearly a potential concern to some of these insiders — "I was astonished to see all the

IBM-compatibility out on the floor. The drop of CP/M is startling."

- There is certainty there'll be a Software "shakeout". A lot of companies are in over their heads.

- It's hard now for brand new producers to be considered by major distributors. "I tend to say no unless they're *really* different from what I already stock."

- The average experience of the sales help in a computer store today is only 6 months. (Expect much more on dealer training this year and beyond.)

*****

In the last hour of the last day, I'm at the PFS booth when a Dixieland band comes marching onto the floor. "Where was this band when we opened?" asks the salesman to my left. "That's when we needed them." (When everyone was waiting for the hordes of dealers who never arrived.)

Richard R. Wolfson, the President of Harvard Software, Inc., a software firm that began in 1983, tells me, "It's just not a selling show. It's really about each other." Now that he's adjusted his expectations to that reality, he gets value out of being here. There are distribution and journalism contacts any small new company hungers for.

At the end of the last day, I'm in the elevator with Bill Mahan, VP of the Northeast Expositions group that put on Softcon. With his Hollywood-star sunglasses and his key-access-only Penthouse, it's clear he's part of "the management" team.

He reports with pride that 80 percent are already signed up for next year.

"You must be jubilant," I say.

"I'm jubilant," he mutters with fatigue.

*****

Now — after lots of writing, lots of talking, lots of requests I couldn't fill from the "Softcon Mailbag" conference on Parti — it's 4:30 a.m. Friday morning, and I'm writing a wrapup. The huge Hyatt atrium just outside my door is silent, the entire cavernous expanse of it. The band has gone home. The lit bronze mobiles hang down 25 floors in peaceful splendor.

The first Softcon ever has created quiet history. And soon I'll be going home.◀

Circle No. 16 on Reader Service Card

TRS-80 ALWAYS AT SALE PRICES

COMPUTER CENTER

WE SHIP FAST!

DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 — (817) 481-7283

OUR TRS-80s Have the Radio Shack warranty

To get YOUR SALE price CALL:
1-800-433-S A L E

MODEL 100

3-D GRAPHICS!!!

One of the newest and most exciting advances of the computer revolution is now available for the Model 100 16K and over — exclusively from ALPHAWARE. With **3-D GRAPHICS**, you can draw a figure on the screen, enlarge it, reduce it, or rotate it in any direction by any degree, all with a 'computer-accurate' perspective of depth. Included with the program is a supply of plotting charts and a complete, example-oriented users manual that's basic enough for the beginner but extensive enough for the long-time user. For the Model 100 owner seeking computer literacy, **3-D GRAPHICS** is a MUST!! USD $49.95

--ALSO AVAILABLE--

MicroEditor II — a multi-function word processing program with powerful features including an exclusive multiple-data form letter routine. One of the best available. USD $49.95

Mail Master — prints mailing labels, sorts mailing lists, prints form letters. MicroEditor II compatible. USD $29.95

M100 Cassette Log — a convenient way to organize your cassette files. 50 pages/pad, enough for 50 tapes. USD $3.50

ALPHAWARE
INCORPORATED
2100 South Boulevard • Edmond, OK 73034

Circle No. 17 on Reader Service Card

JAKE COMMANDER

PORTABLE COMMANDER

INTERRUPT ROUTINE FASTER THAN BULLET, MORE COMPLEX THAN MOSAIC

In this, my last installment on interrupts, I'd like to give you an idea how fast an interrupt-handling routine moves.

Every 4 milliseconds (that's once every 1/250 of a second) the rising edge of a pulse hits pin 7 of the 80C85. This relentless train of pulses enables enough information to get through so the interrupted routine is continued.

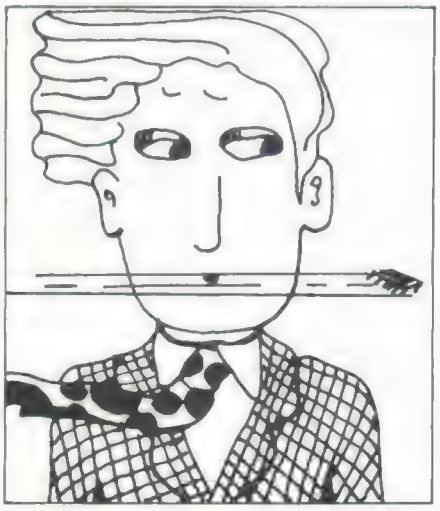
The pulse comes from the time-pulse output of the clock-control chip. As long as interrupts are enabled, the 80C85 will execute a RST 7.5 interrupt which causes it to save the contents of the program counter on the stack and perform a jump.

In a few microseconds, we're somewhere else and two bytes of the stack contain the address of the instruction that *would* have been executed had the interrupt not occurred. All this happens at the hardware level as long as interrupts are enabled.

INTERRUPT-HANDLER. An RST 7.5 causes the MPU to jump to ROM location 003C hexadecimal (hex addresses will be discussed throughout this article). By this time, as I just mentioned, the stack contains the contents of the program counter at the point the interrupt happened. An RST opcode at this point would simply cause a return from the interrupt-handler without anything being done. Although this doesn't happen under normal circumstances in the Model 100, it is possible to make it happen if you want to bypass normal interrupt handling for any reason.

Location 003C contains a disable-interrupt instruction which ensures the interrupt-handler won't interrupt itself for a while. Immediately following is a jump to 1B32 where the real background task starts.

If you run a disassembler and look at the opcodes from 1B32 to 1BB0, you'll see the routine that gets called 250 times each second. If you want the whole, you also need to disassemble from locations 7055 to around 7550. This is because the interrupt-handler exits by using some input/output routines at the end of ROM to blink the cursor and scan the keyboard.



ON LOCATION. First thing, at location 1B32, the interrupt-handler makes a call to a RAM location at F5FF. Usually, this contains a return instruction thereby accomplishing nothing. However, location F5FF can be commandeered by placing a jump instruction followed by the address of a routine to do anything you like. Whatever it was, it will happen every four milliseconds, giving considerable control over the machine. This is where you could completely bypass normal RST 7.5 interrupt-processing if you want.

Following this call, the main registers are saved and further RST interrupts inhibited. The interrupt-handler means business from this point on, so the registers are preserved on the stack along with the return address. The registers now can be used by the handler and restored to their former state, prior to returning to the interrupted code. If this weren't done, that code would suddenly find the results in its registers all wrong.

Once the registers are saved, the handler decrements a counter. This counter's value determines what happens next. Every 125 counts (in other words, every half second) it reads the time and date from the clock chip into RAM; every 12th time through this procedure (in other words, every six seconds) it checks to see if it's time to put the machine to sleep because of the power timing you've set from Basic. That's why the power command works in increments of six seconds.

WHISTLE STOP TOUR. Whatever the setting of the half-second or six-second counter, the routine performs an exit stage left by jumping to location 7391. This decrements yet another 125-count counter which decides whether or not to reverse the character at the cursor. If the character were already reversed, it would be reversed again to make it normal.

This is why you have your blinking cursor and the reason it blinks at the rate it does. FFF3 contains the cursor countdown. If you filled it with a non-zero value faster than once every half-second, you'd stop it from blinking.

If you're getting the idea that this feels like a whistle stop tour of the ROM, you're right . . . and we're not finished yet. Before the cursor-blink routine has done its thing, it pushed a

new return address onto the stack. This means that blinking or not, the next port-of-call will be the keyboard scan routine.

KEYBOARD SCAN ROUTINE. Called every third time, the RST 7.5 interrupt happens. Not once every half-second or every six seconds, but once every 12 *milli*seconds. So, to beat the keyboard, you'd have to type faster than 62 characters a second. Starting at RAM location 7055, the keyboard scan routine starts by placing yet another return address on the stack. This is the final destination. The registers are restored and returned to the foreground code which won't be aware that anything stopped its normal flow.

If a key is being pressed, it is decoded and placed in the keyboard buffer. This buffer resides in RAM at FFAB and can hold up to 32 characters, but if you type any more than this, you'll lose them. If the buffer is full, any further characters are dropped.

The same routine also checks to see if you have an on-key statement in effect. If so, a flag is set to tell Basic to execute the function-key interrupt. Basic will "poll" this flag between statements to see if it should interrupt the flow of your program. (Notice that this isn't an interrupt in the true sense of the word as we're discussing here.) Basic doesn't get stopped at the machine-code level, but makes a decision based on the flag set by the real hardware interrupt-handler. This decision simply determines if your program continues unabated or makes the equivalent of a GOSUB. It's a software rather than a hardware interrupt.

FLASHDANCE. After the keyboard scan routine is done, the event is over. It all happens in a flash: The code which was interrupted will know nothing of what occurred behind its back. Look at your Model 100 and say "1001." In that time, it'll have done what I described in this article 125 times. Pretty impressive.

Hopefully, these articles on interrupts will have shown the power and versatility that they offer. It sometimes can be tricky to program pieces of code that run separately from one another but need to pass pieces of information (such as the time). Despite the overhead in effort it pays off with much more powerful software. ◀

Circle No. 18 on Reader Service Card

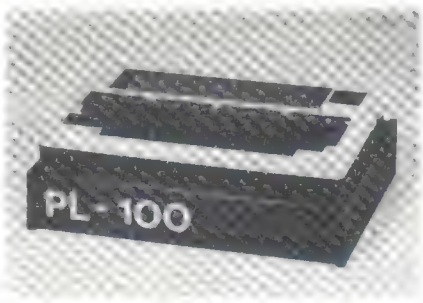
400 FREE PROGRAMS!

Spreadsheets, printing, formatters, diaries, programming, utilities and more.
All available on CompuServe's
Model 100 Special Interest Group.
Just log on to CompuServe and **GO PCS-154** at the prompt.

Take advantage of this freeware today.

EXPANSION TO GO

Battery powered interface for the Model 100. Gives Analog and Digital I/O capabilities to your Radio Shack or NEC portable. Whether in the lab or in the field, Data Acquisition and Process Control are now more affordable than ever. Easy to program using BASIC input and output statements.



Complete PL-100 System $498 includes:

- Expansion Chassis (holds 3 boards)
- Combination I/O board with
  - 16 Channel 8 Bit Analog Input
  - 4 Channel 8 Bit Analog Output
  - 4 Analog Level Sense Inputs
  - 16 Bits Digital Output
  - 16 Bits Digital Input
- Battery Charger / AC Adapter
- 2 Empty expansion slots

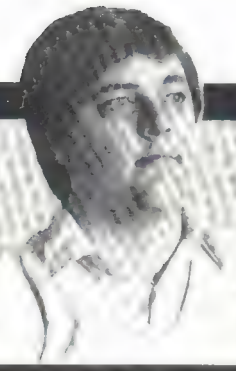
- Uses rechargeable batteries and provides power to the Model 100
- Expansion boards available:
  - High Accuracy 12 Bit Analog I/O
  - 16 Bit Digital I/O
  - Combination Analog & Digital I/O

ELEXOR ASSOCIATES
P.O. Box 246
Morris Plains, N.J. 07950
(201) 299-1615

Circle No. 19 on Reader Service Card

DAVID BUSCH

BUSCH LEAGUE



TEACHING YOUR 100 TO BUILD A PROGRAM GENERATOR

This is the first in a series of columns by Dave showing Portable 100 *readers how to construct a program generator. The columns are based on* The Automatic TRS-80 *by Dave and published by Tab Books.*

Why not let your Model 100 write its own program? Much program writing is nothing more than creating something from an inventory of subroutines.

Many programs have a great deal in common; it's only the parameters that change. Wouldn't it be simpler just to provide the parameters, and let the computer do the routine stuff? After all, one program may require a line like: FOR N=1 TO 100, while the next will need: FOR N=1 TO 200. Yet, each time the programmer had to type in FOR N=1 TO.

THE 100 WORKS. Applications generators and other programs that write programs are old hat. They've been around for a number of years and can be purchased for large computers as well as small. The concept behind them is simple: Many programs have similar modules. Yet, in many cases, the computer programmer writes a routine from scratch each time it's needed. Why not build a library of routines and let the computer draw on them as needed to write its own programs?

The basis behind why a Model 100 can write its own Basic programs lies in its ability to load two types of files into Basic from disk. The normal way a Basic program is saved is in compressed format. That is, Basic keywords are tokenized, and a single byte representing that keyword is loaded into RAM. Rather than store the five letters that make up PRINT, Basic normally just stores a 178, the decimal number representing that keyword.

When you type SAVE "filename," a program is stored in RAM in this form. However, we also can add the .DO extension when saving a program. Then, it will be saved in non-compressed ASCII format. (Every letter and number will be stored, byte for byte, in RAM exactly as the program appears when listed.).

DUAL CAPABILITY. The Basic interpreter has the capacity of doing this conversion for us. An ASCII file is nothing more than a text file, so it's possible to load a non-compressed program into TEXT, edit it using powerful TEXT commands, and then save it back to RAM in ASCII form.

Because of this dual capability, we also can create programs using TEXT, through the sequential RAM files, which are also ASCII files. Look at program listing 1. That program will write a single line to RAM under the filename "TEST.DO." That line will be, if loaded from Basic, a short program in the form:

```
10 PRINT"THIS IS A TEST"
```

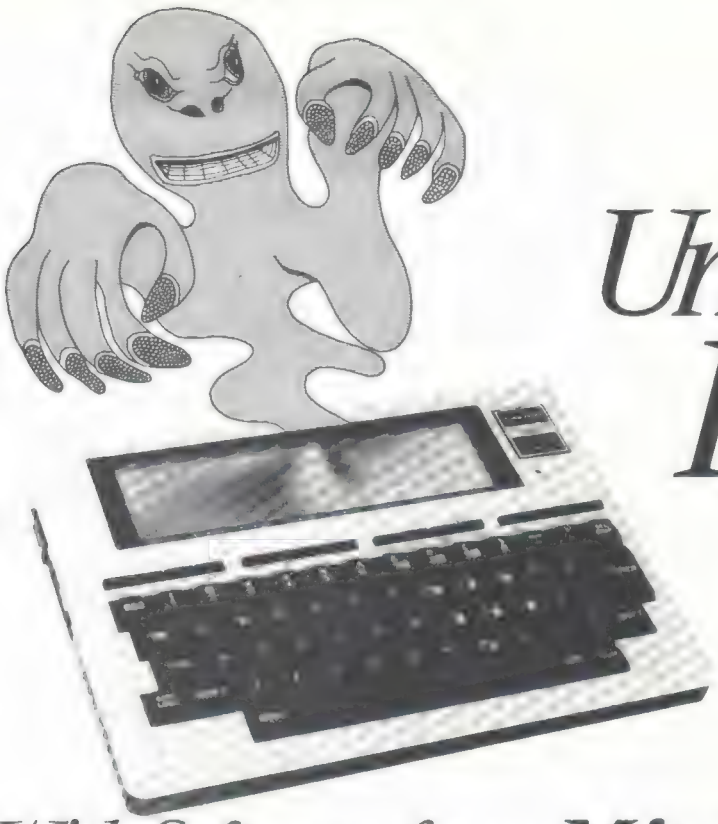
Most of the programs in this series of columns with program writing routines do nothing more than assemble program lines in this manner. Sometimes the input comes from the user; other times it's calculated. But, the common thread is the use of ASCII files, which treats programs as data files.

WORD COUNTER. The first program presented, Word Counter (listing 2), illustrates this principle, even though it doesn't create any new program files. Instead, Word Counter reads an ASCII file, and counts the number of words. Most commonly, these files will be word-processing text files. However, Word Counter could just as easily be used to count the number of words in a program.

Most of the techniques used in this series will be repeated in later programs. Each will be explained in detail the first time they're used. So, early programs are short because explanations are frequent. Later, longer programs will use many techniques previously explained and will thus require fewer discussions.

Programs in this series often access other programs stored in ASCII form in RAM. You *must* save a program to be used by another program in ASCII form, using the .DO extension, and Word Counter is no exception. It will count words in a program file the same as a text file, but only if both are in ASCII. The operator is asked to enter the name of the file to be processed. That file, F$, is opened, and one line input from the disk.

IN A WORD. The line is loaded by means of a line-input statement. An input statment accomplishes the same thing, except it will not accept string delimiters, such as commas and quotation marks, which are commonly used in both text and program lines. Line-input statements impose no restriction. They accept everything up to the



Unleash The Power!

With Software from ***Micro Demon*** *the Full Power of Your Model 100 Comes Alive.*

The Powerful PRO AID

Pro Aid is a machine language utility that adds many powerful new features to your model 100. No matter what you do with the 100, Pro Aid makes it easier. Pro Aid loads in seconds, takes up less than 1.8K of memory, and becomes part of the 100's operating system. If it weren't for all the wonderful things it does, you would never know it was there.

NEC advertises that their version of the model 100 has 10 function keys. Pro Aid takes advantage of unused key sequences to give you 26 extra function keys—all more useful than the F1-F8 keys. Not only can these easily-definable keys be used in BASIC, but also in TEXT, TELCOM, ADDRSS and SCHEDL. The possible uses are enormous. The instruction manual discusses and illustrates many possible applications.

Also - With PRO AID You Can

- Use automatic line numbers with any starting line number and any increment.
- Delete any range of lines with a single stroke.
- Add a RANDOMIZE routine to your BASIC programs.
- Access TEXT, TELCOM, SCHEDL, ADDRSS directly from BASIC.
- Use the special immediate mode to perform direct calculations and provide new functions such as multiple PEEK and POKE, Hex to decimal and decimal to Hex.
- Activate the auto-off feature manually in any mode.
- Perform selected BASIC commands by control keys.
- Check program status and more.

The PRO Aid comes complete with extensive documentation for the low price of $39.95.

The Music Program

The new Micro Music Program can turn any model 100 into a musical instrument by modifying the sound routine. Comes complete with instructions, for just $19.95.

The Disassembler

Micro Demon offers you a disassembler with all the bells and whistles for just $29.95. This handy program was used to obtain the ROM map in the December issue of *80 micro*.

You can order by calling (803) 733-0980 (24 hour order line). Or send mail orders to Micro Demon, Inc., P.O. Box 50162, Columbia, SC 29250. Visa and Mastercard are welcome.

Quantity	Product (Price)	Total Price
	PRO AID ($39.95)	
	MUSIC PROGRAM ($19.95)	
	DISASSEMBLER ($29.95)	
Payment by	Total Cost of Items	
☐ Visa	Sales Tax: (SC Residents Only. 4%)	
☐ MasterCard	Shipping & Handling	$1.50
☐ Check	Total Amount Due	

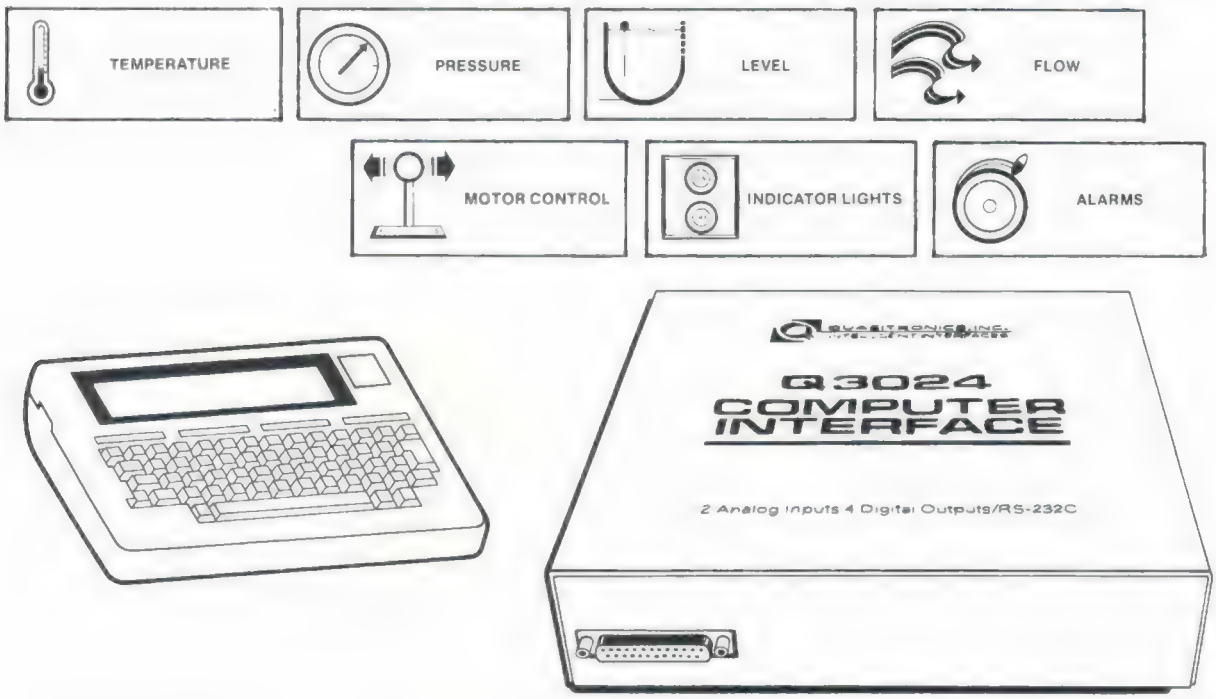
Card Number _____ Exp. Date _____

Name _____

Address _____ City _____ State _____

Signature _____

Make your Model 100 Grow... with the Q-3024 Interface from Quasitronics



For less than $500* you can add this proven interface unit and expand your Model 100's capabilities. Now you can use it for data collection and to control and actuate alarms, motors, pumps, heaters, laboratory apparatus and a host of other equipment. Hundreds of these quality interfaces have been in use for over a year with documented results.

Take a good close look at this combination of performance benefits.

- Easy to connect to any computer with an RS232 serial port.
- Can be programmed through Model 100 in BASIC.
- Contains a Z-80 micro.
- Can store information on discs to permit long-term data logging (or it can print out).
- Provides 2 high resolution analog inputs; 4 digital outputs.
- Can rescale information into engineering units for your own programming.
- Can control up to 4 devices such as alarms and actuators.
- Sample software examples included on disc.
- Compact—only 8⅝" x 8⅝" x 2".

And there's more!

Quasitronics has specialized in interfaces for over a decade. The Q-3024 is just the first in a new and complete line of state-of-the-art interfaces. It's ready now for immediate shipment from stock.

We'll be adding other interfaces soon. If you'd like to learn more about Quasitronics, the Q-3024, and our expanding line of interfaces, call Chuck Jones, collect, or write to the address below. Dealer inquiries are most welcome.

*List price $495.00 each (plus shipping). Quantity discounts available.

QUASITRONICS, INC.
THE INTERFACE PEOPLE

211 Vandale Drive, Houston, PA 15342 • Telephone 1-800/245-4192 Telex 81-2550

Circle No. 21 on Reader Service Card

next carriage return, which will be the end of a program line or a carriage return in the text itself.

To search for a word, we need first to decide just what a word is. The easiest thing is to realize that a word is more or less a group of letters preceded and followed by a space.

For instance, codeword is one word, even though two real words are embedded in it. "Oh! No!" is two words, with the punctuation not a part of each word. But for the purposes of this program, we'll consider it is. This is because Word Counter has been written to look for each space that's preceded by a non-space.

COUNTING SPACES. This wouldn't be an accurate way of counting words, so the program instead looks at each character, and when it finds a space, looks to see if the last character was a space. If not, the end of a word is deemed as reached.

Each line input, stored in A$, is looked at one character at a time in a For-Next loop beginning at line 240. The loop repeats from 1 to the length of A$. Each time through, C$ is assigned the value of the next character in the string, through the use of MID$(A$,N,1).

If C$ is a space (CHR$(32)), the program looks at the last character checked (L$) to see if it was a space. If it wasn't a space, but a character, the program assumes the end of a word has taken place (since no word contains an embedded space). Thus, the word counter (CU) is incremented by one.

FIRST SHALL BE LAST. Before the loop goes back to look at the next character, the current character is stored in L$ (line 270) and becomes the last character. Once the program has looked at every character in the string, it drops down to line 290, where the end-of-file flag is tested. If it is one, meaning the EOF marker has been reached, the program goes to line 310 to present the results of the word count. Otherwise, the program goes back to line 210 to input another line.

When the file is finished, the program prints the number of words (CU) and then calculates the average word length, which is the number of characters (CHAR) divided by the number of words. The number of characters also is divided by five to total the amount of standard, five-character words. ◀

Program Listing 1. ASCII-Basic Test.

```
10 OPEN "TEST.DO" FOR OUTPUT AS 1
20 PRINT #1,"10 PRINT";CHR$(34);
   "THIS IS A TEST";"CHR$(34)
30 CLOSE 1
```

Listing 2. Word Counter.

```
10 ' **********************
20 ' * *
30 ' * Word Counter *
40 ' * *
50 ' **********************
60 CLEAR 4000
70 DEFINTA-Z
75 ' *** Instructions ***
80 CLS
    : PRINT
    : PRINT
90 PRINT
100 PRINT "This program will count
    the number of"
110 PRINT "actual words in a text
    file. It also"
120 PRINT "provides the total number
    of standard
130 PRINT "five-character words, and
    the average"
140 PRINT "character length of words
    in the text. "
150 PRINT TAB(4)"== Hit any key to
    continue == "
160 IF INKEY$ =""GOTO 160
170 CLS
    : PRINT
    : PRINT
175 ' *** Access RAM File ***
180 PRINT "Enter name of file to
    count:";
190 LINE INPUT F$
200 OPEN F$ FOR INPUT AS 1
210 LINE INPUT #1,A$
215 ' *** If End of File Found, Set
    Flag to 1 ***
220 IF EOF(1) THEN FL=1
225 ' *** Add Length of A$ to Total
    Characters in File ***
230 CHAR=CHAR+LEN(A$)
235 ' *** Loop to look at each
    character in A$. If current
    character, C$, is a space, and
    L$, previous one was not, then
    the word counter CU is
    incremented ***
240 FOR N=1 TO LEN(A$)
250 C$=MID$(A$,N,1)
260 IF C$=CHR$(32) AND L$<>CHR$(32)
    THEN CU=CU+1
270 L$=C$
275 PRINT @139,CU
280 NEXT N
290 IF FL=1GOTO 310
300 GOTO 210
305 ' *** Print out Results ***
310 CLS
    : PRINT
    : PRINT
320 PRINT "NO. WORDS =";CU
330 PRINT
340 AW=CHAR/CU
350 PRINT "AVG.WORD LENGTH =";AW
360 PRINT
370 SW=CHAR/5
380 PRINT "NO. 5-CHARACTER WORDS =";SW
390 PRINT
    : PRINT TAB(6)"== Hit any key ==
    ";
400 IF INKEY$ =""GOTO 400
410 CLOSE
415 ' *** Do again? ***
420 CLS
    : PRINT
430 PRINT TAB(4)"Check another file?"
440 PRINT TAB(10)"Y/N"
450 A$=INKEY$
    : IF A$=""GOTO 450
```

BILL LOUDEN

TELECOMPUTING

GET ON LINE AND BE ON TOP WITH ALTERTEXT

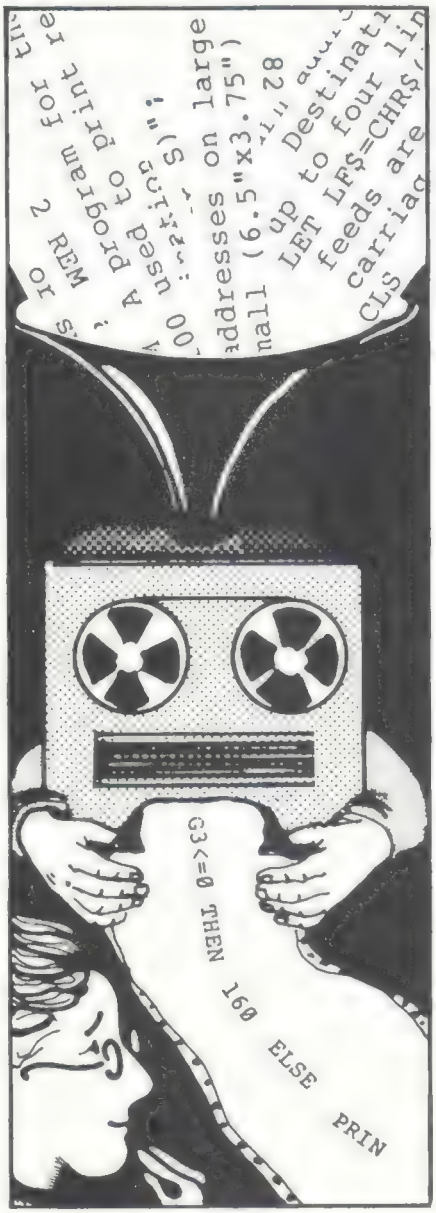
Of all the data bases on CompuServe, the one I use religiously every month is The Altertext Report, a monthly column abstracting major developments, announcements, and other inside information in the computer and electronics industry.

Each month, I found it impossible to faithfully read or even scan the more than 200 computer and electronics magazines currently published and always was worried about missing a pertinent topic somewhere. Trying to read each magazine by the end of the month was a self-imposed deadline I didn't need.

TEN MINUTE SAVVY. There's no fancy keyword search available but The Altertext Report can be read (or downloaded) in about 10 minutes depending on the length of the current month's issue. The first menu contains monthly issues for the current year. Pressing enter displays the second menu page containing 1983 back issues. Currently available are over 14 months of abstracted information.

HIGHLIGHTS MONTHLY. By entering the selection for February 1984 (see figure 1), I received an introductory page highlighting key news. But each monthly report contains over 100 news abstracts and really should be read for pertinent information. The highlights for February 1984 were:

- Apple Fights Back
- Convergent Technologies Gets A Boost
- Disk Copying Systems
- The AT&T/Olivetti Deal



1 January 1984
2 February 1984

1 Description of Service
2 January 1983 8 July 1983
3 February 1983 9 Aug. 1983
4 March 1983 10 Sept. 1983
5 April 1983 11 Oct. 1983
6 May 1983 12 Nov. 1983
7 June 1983 13 Dec. 1983

Figure 1. Altertext Menu.

NEWS AT A GLANCE. I've included below a few excerpts from the report, CompuServe Page ALT-985:

"According to the National Science Foundation, encyclopedias in printed form will disappear by the year 2000. The combination of the information explosion, limited shelf space, and cost limitations will help to replace printed encyclopedias with electronic data bases. Libraries will have little choice but to go electronic.

"Similarly the new information age is generating demand for a new kind of library which does not lend out materials and is not free. Software libraries with paid membership are spreading quickly. They allow members to experiment with software programs before making a purchase. The largest one is the PC National Software Reference Library in Fairfax, VA (see *Today* 1/84) [A reference to CompuServe's *Today* magazine].

"John Sculley, president of Apple Computer, refers to 1984 as 'the year Apple fights back.' It will introduce at least three new personal computers this year including: a portable Apple IIe for under $1,000; The Lisa II, faster yet less expensive than the current Lisa; The Macintosh, an easy-to-use, $1995 unit to go head-to-head with the IBM PC.

"Apple is very strong in the educational market which helps serve as a

springboard into the home (see *Business Week* 1/16/84).

"U.S. corporations like American Express, Best Western Hotels, Control Data, Blue Cross Blue Shield, and New York Telephone all have experimented with telecommuting with favorable results. Improvements in personal computers, facsimile transmitters, and communications gear have helped home-to-office links become a reality. Gains in employee productivity are common, but some employees who have tried telecommuting fear they might stagnate by losing touch with the mainstream (see Business Week 1/23/84)."

Each abstract contains the source and date if you wish to obtain the entire article.

SEARCH TOOL NEEDED. Although I find The Altertext Report a valuable aid in keeping abreast of the rapidly changing computer industry, I wish it contained some sort of keyword search aid. It'd be nice to search for abstracts that contained "IBM," "portable," or "TRS-80" for example. But lacking that feature, I still find The Altertext Report to be my most productive 10 minutes each month.

For more information on The Altertext Report write to Altertext Incorporated, 210 Lincoln Street Suite 300, Boston, MA 02111, 617-426-0009.

GOODBYE COLUMBUS. In February I left CompuServe for a new position and challenge in Colorado. My years working for CompuServe making the Videotex Industry a reality in the United States have been enlightening and rewarding. It was difficult to leave behind my adopted child, Videotex, but I'm excited about the prospect of bringing some order to the world of microcomputer software.

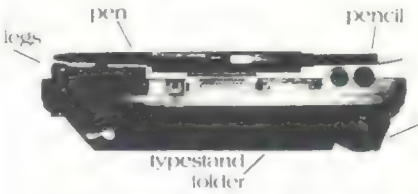
My new firm is The Menu International SoftWare Database. Its goal is to provide an electronic alternative when you need to find that obscure perfect piece of software. I intend to continue writing this column, though, and hope my "new distance" from CompuServe will add greater objectivity.

If you wish to contact me in response to my column or to provide ideas for future columns, my CompuServe User ID is 70007,1660; or you may contact me via MCI Mail as well at user name BLOUDEN. ◀

BE PORTABLE

"Carry your *Workstation-100* with you"

PORTABLE



- All WORKSTATION-100 components conveniently attach and detach using self-adhesive velcro—"They are there when you need them".
- Your computer will still fit in the original case—"As portable as ever".

PRACTICAL

- Convenient TYPESTAND/CLIP-FOLDER stores papers, manual, and business cards while improving typing efficiency.
- PEN and PENCIL set are always handy.
- SUPPORT LEGS are always ready when needed.
- BATTERY PACK stores four "AA's" in case the Low Battery light strikes.

INEXPENSIVE

Just $14.95 for complete kit

CALL 1-804-794-6675
or mail Order Blank to:

A.R.M.S.
12131 Old Buckingham Rd.
Midlothian, VA 23113

Check Approp Boxes
☐ Workstation-100 Complete Kit (Save $3.50) $14.95
☐ Type Stand Folder $6.50
☐ Pen $2.75
☐ Battery Pack $3.95
☐ Support Legs $3.50
☐ Mech. Pencil $1.75

Please Add $1.00 Shipping & Handling (VA. RESIDENTS ADD 4% Sales Tax)

CHK, VISA/M.C. # _____ Exp Date _____ Amount Enclosed $ _____
(Circle one)

Circle No. 22 on Reader Service Card

The Portable Accountant

Accounting System for the Model 100

- Allows More Time for Professional Services
- Improve Report Turnaround
- Speed Client Writeups
- Reduce Errors

The PORTABLE ACCOUNTANT provides a fully integrated accounting system for any small business featuring:

Cash Disbursements Journals
Cash Receipts Journals
General Journals
Detailed General Ledger
Trial Balance
Automated Backup
Automated Balance Forward

Mail to: The Portable Accountant
FACS, Inc.
Box 2132, White Flint Mall, Kensington, Maryland 20895

☐ Enclosed is my check for $99.95.*
My Model 100 is a:
☐ 8K ☐ 24K ☐ 32K System

☐ Please charge $99.95* to my
☐ VISA ☐ MasterCard
Account # _____
Exp Date _____

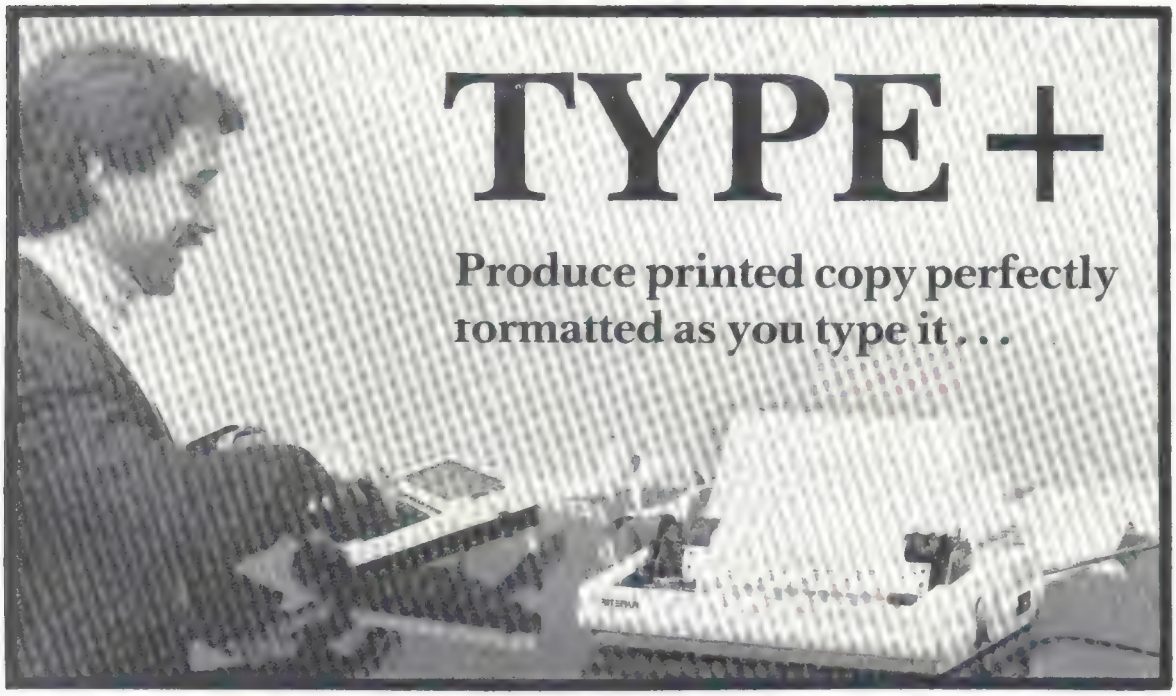
Signature _____

Ship to:

Name _____
Street _____
City/State/Zip _____

Circle No. 23 on Reader Service Card

YOU WILL NEVER USE TEXT AGAIN . . .
TO ORIGINATE A DOCUMENT



YOUR MODEL 100 PLUS ANY PRINTER BECOMES THE MOST FEATURE-RICH ELECTRONIC MEMORY TYPEWRITER YOU CAN BUY

TYPE+ is an exciting new program from **PCSG** that completely changes the way you use the Model 100.

Simply put the cursor on **TYPE+** on the Main Menu, press **ENTER** and you are immediately typing directly on your printer.

It lets you generate and create documents on your printer as finished copy. You see it as it comes from the computer and you can arrange it the way you want, right on the paper.

Fantastically, everything you type is stored in a **.DO** text file. You set the margins, left and right. Paper feeds automatically into the printer with a function key setting.

A screen buffer that you control, allows you to view your last line before it goes to the printer. You can set the screen view area from an entire line of characters to one word to immediate print as you desire.

You can send the text to the file formatted as you typed it, or unformatted for less memory consumption (if you send it unformatted you can format it with **SCRIPSIT 100**).™

You have features for word processing that you thought were missing. For example: full **TAB** control, you set as many as you want, where you want them, with a function key, automatic centering of words or phrases, on and off with the function key.

Everyone who starts to use **TYPE+** is immediately addicted. We have heard the statement "I'll never use **TEXT** again to write a letter," from every person who has used the program.

Other comments from users show us that this is a very logical method of generating a document. You are creating it and seeing it on paper, but you're also writing it to memory at the same time so that you can edit what you have created any time you wish.

The use of the function keys in this program will amaze you. You can right justify, set margins, underline, do boldface print, on any printer, all with function key switches, (no control codes to look up and enter).

You will love this program. We honestly got rid of our typewriters. You will wonder why this concept hasn't been done before. It is the logical way to create a document.

PORTABLE COMPUTER SUPPORT GROUP

Type+ is part of Business pack II

CALL 1-214-351-0564 MASTERCARD/VISA/COD.

IT'S BRAND NEW
IT'S DIFFERENT

you loved businesspak+

Now businesspak++

$89.95

Six more programs designed for the businessperson
Each on its own cassette
Excellent easy to follow manuals

Again PCSG provides for your Model 100 programs that turn your computer into a far more powerful business tool. Picture what you could do with these programs.

INVOIC: Prepares invoices, does purchase orders, does time billing. Prints out on printed forms complete with math extensions, sub-totals and totals. Remembers stock items and unit prices, or type in new. Automatically numbers. Choice of long or short forms. Stores records in RAM file. (Your record file interfaces with AR program sold separately.) So fast and easy it could be used as a cash register.

FINANC: Writes checks, balances checkbook, reminds you of regular expenses and due bills. Prints detailed report. Maintains category records. Interfaces multiple accounts. Keeps track of charge accounts.

TELEX++ New super Telex sending program that enables you to send Telexes and Mailgrams from any phone in the country using nationwide toll-free number with automatic verification of receipt instantly.

CALNDR: Generates up to an 18 month calendar. Prints out full sized calendar pages with events you schedule, detailed in each day's box. Print single week, month, year or 18 months. Records accessible on screen as well. Print out looks like page of conventional wall calendar.

TYPE+: The Model 100 now becomes, with the addition of any printer, the finest, most feature rich, electronic typewriter available today. You can type directly to the paper (some printers have a one line buffer). Underlines, and does bold-face print on any printer with function key (no control codes to look up or embed). Right justifies at the touch of a function key.

BRKEVN: Analyzes your business, or any business proposition. You enter cost of each raw material, detail of fixed costs and variable costs. Calculates point at which your business breaks even, or shows a profit or loss.

You examine costs, sales volume or price at different levels. Prints out detailed report showing all entries and studies of each variation.

Be the hero at meetings. When your associate says "We'll sell twice as many if we lower the price ten percent," you can key into your computer and quickly say "Yes, but we'll lose a dollar on every one we sell." And then print out a study of the whole price vs volume picture.

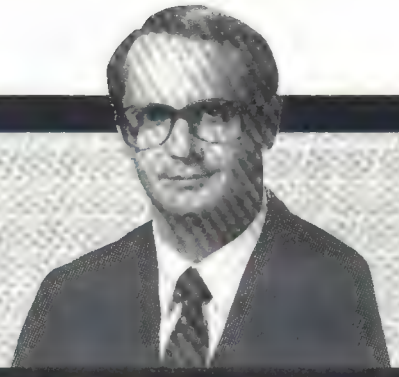
11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

PCSG provides hotline software support for Model-100. Call 1-214-351-0564. Available now directly from Portable Computer Support Group. We endeavor to continue as The Leader in Software for the Model 100.

SCRIPSIT 100 is trademark of Tandy Corp.

BILL WALTERS

TANDYTALK



WHAT WILL THE FUTURE LAP-SIZED PORTABLE BE LIKE?

Thousands of thoughts are flying through my head: I hope everyone enjoyed April's column; it actually came out of a late evening brainstorming session last fall over several glasses of famous Texas brew. Who said we work all the time?

SMALL & VERSATILE. This month I'd like to ramble about the future. It's a pretty safe area to be dabbling in, since quite a few folks have been making predictions on what the next-generation portable computer should look like. One caveat here, though, I'm *not* foolish enough to describe current or future projects under development. (Please don't call me and ask when you can order one!)

Succinctly stated: "It should be small and do everything." Great statement . . . But, how small is small?

I grew up reading Dick Tracy comics and was a strong believer in the two-way wrist radio which later turned into a two-way television. That's impossible, isn't it? No, it isn't. Almost wherever I go, I carry around a small amateur transceiver, not much bigger than those walkie-talkies sold in stores for $5.95. (Mine cost a heckuva lot more than $5.95 though!) With my trusty hand-held, I can make a telephone call in almost any city across the United States. Not quite Dick Tracy but it's close; a lot closer than I would have thought possible 10 years ago as a "responsible mature adult."

IN THE FLESH. Is an even smaller unit possible? You bet. Have you ever watched television closely when the secret service is escorting the president? You can tell the Secret Service folks, they're the ones with the dark glasses who never seem to be looking at anyone, just looking frantically at everyone. If you watch them closely, you'll see one lift his arm up to check the time, except it looks like he's nearsighted and his lips are moving. You got it . . . Dick Tracy in the flesh.

Sony has capitalized on the "whatever-man" fad and now has the "Watchman". Have you seen one? It's not much bigger than the original Walkman, but instead of playing your favorite stereo tapes, it'll view your favorite soap operas on a tiny black-and-white, television screen.

I said earlier I was a Dick Tracy fan, but boy 'o boy, reading a 25-line-by-80-character display on that little beauty would really give you eye strain! I wonder how much longer it'll take to make the screen a tiny bit bigger, just a little bit flatter so it'll slide into your favorite portable computer? Hmmm . . . sounds interesting.

NEXT GENERATION. Future models probably won't be much smaller than the current Model 100. At least I don't see it shrinking in either width or depth. Most users will continue to demand a full-size keyboard usable for touch typing and that'll be the limiting factor, that is until voice input becomes perfected. Thickness should be improved as thin-film technology comes down in cost but the total height will depend on how thick that little TV tube is.

Storage technology is improving but portable disk units still consume a tremendous amount of electrical power. Also, a 3.5-inch floppy disk drive is big when compared with the total package size that should be achieved. Bubble memories are too expensive and take too much power too. Their cost will come down in the next few years, but I don't see them becoming the standard except for very high-priced products.

Perhaps some sort of other low-cost, low-power, small-size storage device will become available. What about a one-inch floppy, or a two-inch? Who knows? Only one thing is for certain: The entire electronics industry is waiting for such a product. Any inventive spirit in you? ◀

TEL-LTR(tm)

THE PERSONALIZED ELECTRONIC SYSTEM

TEL-LTR(tm)

No more look-alike grams. Your letter can now be customized with a personality of its own.

TEL-LTR is THE ELECTRONIC MAIL SYSTEM that allows you to send those necessary letters — TODAY — from your PORTABLE 100.

This service is for the BUSINESSPERSON who wants to send a "THANK YOU" letter to a client just visited — for the ENGINEER who needs to confirm SPECIFICATIONS in writing — or the JOURNALIST who wishes to forward COPY of an article just written.

TEL-LTR is the service that does this AUTOMATICALLY from your MODEL 100. It produces a letter on your own LETTERHEAD and sends it in a personally addressed ENVELOPE (not a window envelope) with a postage stamp. And best of all you get a hard copy CONFIRMATION!

Letters are produced in the normal "TEXT" mode off-line. When ready to transmit one or more letters, call in the "TELLTR" program — plug in either the direct connect cable or acoustic cups — depress a function key and the rest is done automatically.

TEL-LTR allows you to send your correspondence from ANY PHONE — ANY WHERE. NO need for special PASSWORDS — LOGON sequences etc. TEL-LTR is the first "AUTOPILOT" communications package for the MODEL 100.

TEL-LTR allows you to send TELEX messages and provides you an ELECTRONIC MAIL BOX for intra-company use. All messages for others in your company are handled in the same transmission and when the Model 100 is finished transmitting it automatically picks up any MESSAGES waiting for you and DOWNLOADS them into your 100 for reading at your leisure.

The TEL-LTR division of GUNTHER INTERNATIONAL is DEDICATED to the most complete on-line facilities EXCLUSIVELY FOR THE MODEL 100.

TEL-LTR(tm)

SOON TO BE AVAILABLE

——ELECTRONIC ORDERING & DELIVERY OF MOD 100 SOFTWARE——
——ELECTRONIC NEWS SEARCH——
——ELECTRONIC BULLETIN BOARD——
——ELECTRONIC CONFERENCE ROOM——

FIRST PAGE OF EACH LETTER $1.75 (includes postage and transmission charges), EACH ADDITIONAL PAGE $.75. To become a member of this revolutionary service, call TOLL FREE 1-800-CALL-800 (1-800-225-5800). There is no membership fee nor monthly minimum-useage requirement. Credit card information must be provided when you become a member.

Gunther International, P.O. Box 586, Mystic CT. 06355
Tel. (203) 536-4926

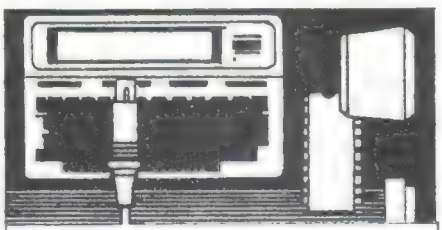
(tm)Tandy Corporation

Circle No. 25 on Reader Service Card.

TANDY DVI: TRADING PORTABILITY FOR DESKTOP IMAGE

When Tandy released the 100, a cry arose for more storage and a CRT. Fort Worth responded with a disk-video interface.

By JOHN P. MELLO JR.



HARDWARE

Since the introduction of the Model 100, its faithful have clamored for two things: more memory and more storage. Tandy Corporation hasn't addressed the memory situation yet, but it has taken on the storage issue with its $799 disk-video interface.

CONNECTIONS. The interface connects to the expansion bus (the secret behind the black door on the bottom of the 100) by inserting a "zero force" adapter (see photo 1) into it, lifting the adapter's release lever, plugging the interface's cable connector into the adapter, and locking it in place by lowering the lever.

In using this connection method, Tandy tried to make the best of a bad situation. Its logic: The zero force connector would keep the pins in the fragile 40-pin connector from being bent and broken from numerous insertions and withdrawls. However, after a month's wear and tear, I found myself dangerously bending pins to make the connection.

And although the zero-force connector is supposed to remain in the 100 when the cable connector is removed, I found it occasionally falling out of the expansion bus after I disconnected the 100 from the interface.

The flat ribbon cable connecting the 100 to the interface has set some acerbic tongues wagging on Compuserve's Model 100 Special Interest Group — with good reason. Only a mother could love the short, ugly, silver cable. No sitting back with a 100 leashed to this device. Sit at attention or else!

Another problem: When the 100 isn't tied to the interface, the connector's delicate pins are unprotected and exposed to potential damage.

The interface is connected to a television set or a monitor (neither supplied with the unit) with a cable connector and switch box (both supplied with the unit).

OPERATING SYSTEM. When everything's connected, turn on the monitor. Then a precise power sequence must be followed: Turn on the 100; turn on the interface. If this sequence isn't followed, the system won't work properly.

The interface's operating system is loaded into the 100 from disk. This is done by resetting the 100, turning the power off and on, or forcing a cold start by pressing simultaneously control-pause-reset. According to Tandy's documentation, the system occupies 4.5K of RAM, but when I loaded the system into my empty 32K machine (29,638 bytes free), I had only 23,929 bytes left. That would peg the system's size at 5709 bytes.

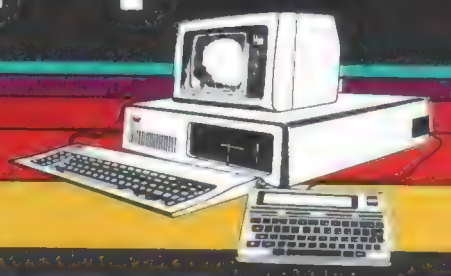
The system resides in high memory (see figure 1) and is invisible. The only way to kill the beast is to cold start the 100. Jesse Bob Overholt, who has contributed several articles to *Portable 100*, suggested to Model 100 SIG members the system might be cleared by CALLing 32454 (removing the hooks from the ROM to the disk system), then CLEARing 256,MAXRAM. I tried this, but retrieved only 28,833 bytes of my original 29,638.

Loading the operating system provides quite a shock to the 100. Invariably, my 100's clock was cleaned every time I loaded the system. I have seen comments on the Model 100 SIG about system loads automatically cold starting 100s, thus cleaning out RAM files. That never happened to my 100 — only a time reset to: Jan 01,1900 Sun 00:00:00.

BELIEVE IN MAGIC. Once the operating system's loaded, the 100 can access the monitor by entering BASIC and using the command: SCREEN 1,1. The system default is 40-column-by-25-line

FILES TRANSFERRED INSTANTLY WITH A SINGLE FUNCTION KEY

DISK+



NOW your MODEL 100, plus your other computer is an instant disk system

FINALLY! Use disk storage with your Model 100

SIMPLE! Transfer any file (Text, Basic, Machine Code) with a single function key

T'S SO EASY!

imply place the disk in the disk drive and power up. Place cursor on DISK+ on your Model 100 nenu and press enter. You are shown the disk lirectory on your Model 100 screen. You transfer ny file from RAM to disk or disk to RAM with nerely a single function key. **INSTANTLY!**

FULL ERROR CHECKING!

Guaranteed integrity of all data you transfer. Every line transmitted until verified, at 19,200 Baud, 10K bytes in 5 seconds!

COMPATIBLE!

ALL TEXT FILES COMPATIBLE WITH OTHER COMPUTERS.

DISK+ $69.95 Includes cassette, disk and excellent manual
(CABLE $40.00 — or use RS232 with null modem)

MC, VISA, or C.O.D.

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

PCSG PROVIDES HOTLINE SOFTWARE SUPPORT FOR THE MODEL 100. CALL US AT 1-214-351-0564

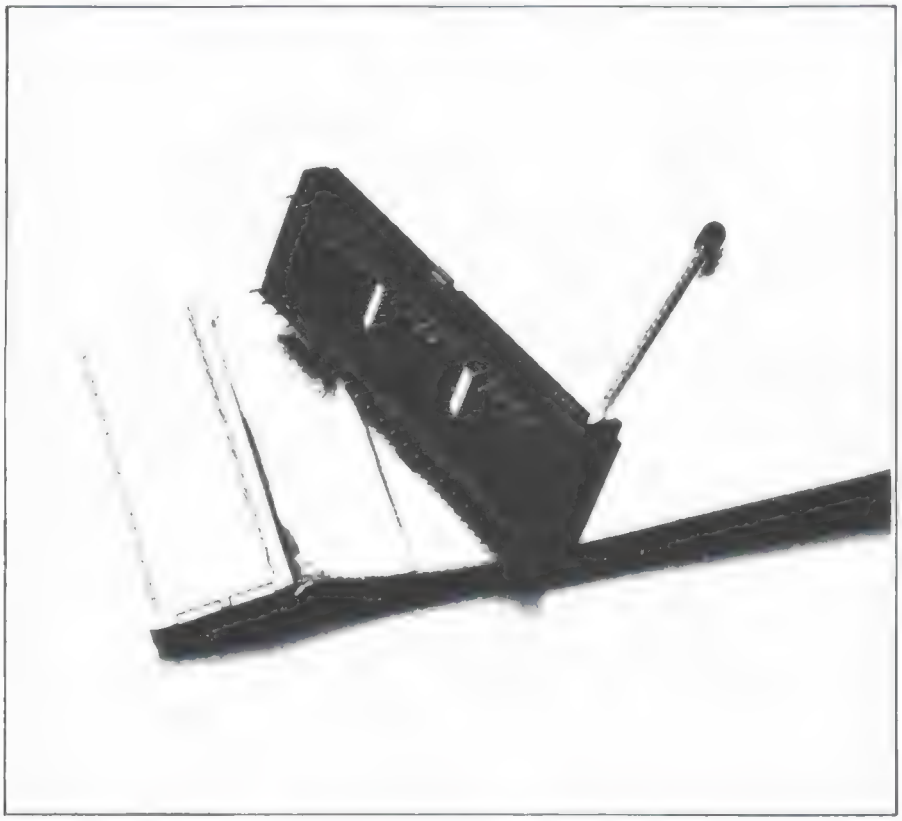


Photo 1. Zero Force Adapter

DISK-BASIC KEYWORDS

KEYWORD	TASK
KILL	Deletes a program or data file
LOADM	Loads a machine-language program
LFILES	Displays filenames on the disk
MERGE	Merges a Basic program (in ASCII format)
NAME	Changes the name of the file
RUN"program"	Loads and executes a Basic program
RUNM"program"	Loads and runs a machine-language program
SAVE	Saves a resident Basic program
SAVEM	Saves a machine-language program
SCREEN	Assigns the console to a specified device
WIDTH	Sets the screen width
CLOSE	Closes open file
DSKO$	Writes a string on a specified sector
INPUT#	Reads from the disk in sequential mode
LINE INPUT#	Reads a line of data in sequential mode
OPEN	Opens a file or CRT for use (creates a file on disk if specified)
PRINT#	Writes to the disk in sequential mode
CSRLIN	Gets the vertical coordinate of the cursor
DSKI$	Gets a string from a specified sector
EOF	Checks if end-of-file encountered
INPUT$	Gets a string of characters from a file
LOC	Gets current record number
LOF	Returns number of last record in file
POS	Returns the current cursor position
CHR$(27) + code	Begins escape sequence for CRT

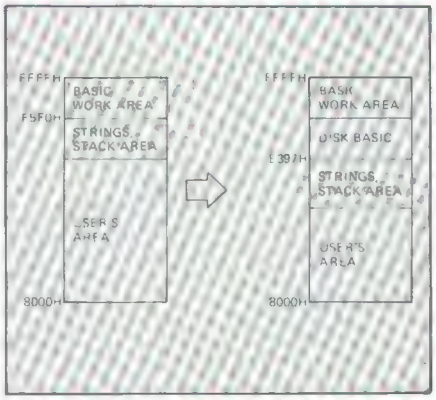


Figure 1. Model 100 RAM Before and After Loading Disk-Basic

mode (see photo 2). If a monitor is used, an 80-column-by-25-line display (photo 3) can be achieved by entering: WIDTH 80. The display appears slightly cramped in both modes.

Now everything typed on the 100 will appear on the monitor — including all the 100's special characters. Dot-graphics, though, are not supported. And the main menu never appears on the CRT, only on the portable's liquid crystal display.

When writing and editing a document, all TEXT's commands — select, cut, paste, delete — work beautifully on the monitor. The same is true for Edit in BASIC.

With the monitor hookup, TELCOM's Preview is obsolete. Eighty-column videotex pages entering the 100 merrily roll across the CRT.

DISK DRIVE. Although the video interface is nice, the device many 100 owners will be salivating over is the unit's disk drive. In fact, many owners may ask why Tandy didn't market the disk drive alone. Bill Walters, Tandy's "buyer" for the 100, explained in a conference on the Model 100 SIG:

"I purchased [the interface] from the manufacturer as a package deal. I would have preferred to have the video interface as a plug-in unit or separately, but it just wasn't in the cards. It would have driven up the price another $200 — definitely not worth it."

The single-sided, double-density, 5.25-inch drive stores 184K of data. That storage capacity is low compared to double-sided drives (500K to 700K, unformatted) or Sony's 3.5-inch drives (500K on a side, unformatted), but cost probably was a chief concern here, too. There is also room in the interface for another half-height drive.

DISK BASIC. With the disk drive, comes the potential for serious data manipulation using Disk-Basic commands (see keyword table).

Converting programs to access the disk instead of RAM isn't difficult. It's made easier because Disk-Basic and 100 Basic share the keywords for input and output. I took a simple telephone log program I wrote, modified one line, and it worked with the disk.

However, I found a problem in using APPEND. The log program creates a file called TEL.DO. In 100 Basic, this is done by:

```
OPEN "TEL.DO" FOR APPEND AS 1
```

When I translated that statement to Disk-Basic,

```
OPEN "0:TEL.DO" FOR APPEND AS 1
```

I received a file not found error. In order to use APPEND in Disk-Basic, an output file must be created first.

Other Disk-Basic commands let the 100 save and load Basic and machine-language programs (although the only machine-language program I attempted to run while the interface's operating system was in my 100 cold-started my machine).

DOCUMENTATION. The interface's documentation will be familiar to 100 owners. It's similar to the 100's manual. I had no trouble following the directions in the book or understanding the explanations of the Disk-Basic commands.

The interface manual is 63 pages long and contains an appendix for connector-pin assignments and another for technical information (system block diagram, character code tables, and Disk-Basic error codes). The manual is without an index.

WHO'S IT FOR? Anyone thinking of buying the disk-video interface should carefully consider his or her options. Creating 40- and 80-column text and storing programs to disk are important considerations, but so is portability — something the AC-powered interface doesn't have.

And so is price. When the price of the interface is added to a 24K 100, the pricetag totals $1800. That's the same price as a TRS-80 Model 4, which has almost the same portability as the disk-video-100 combination.

If the 100 is a second machine, a buyer probably wants only the disk-drive capability. There are programs on the market, selling for less than $100, for making a second computer — like the Color Computer — a dumb terminal for the 100.

For my money, I'd have to say I'd trade that sexy 80-column screen for portable storage any day of the week. ◀

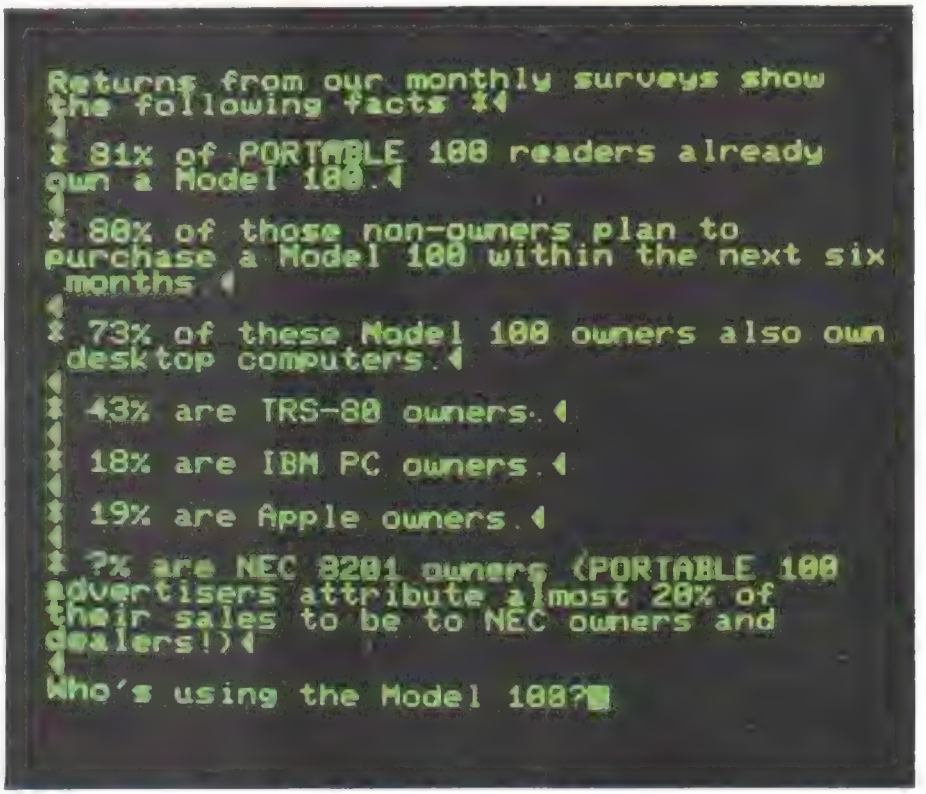


Photo 2. 40-Column Display

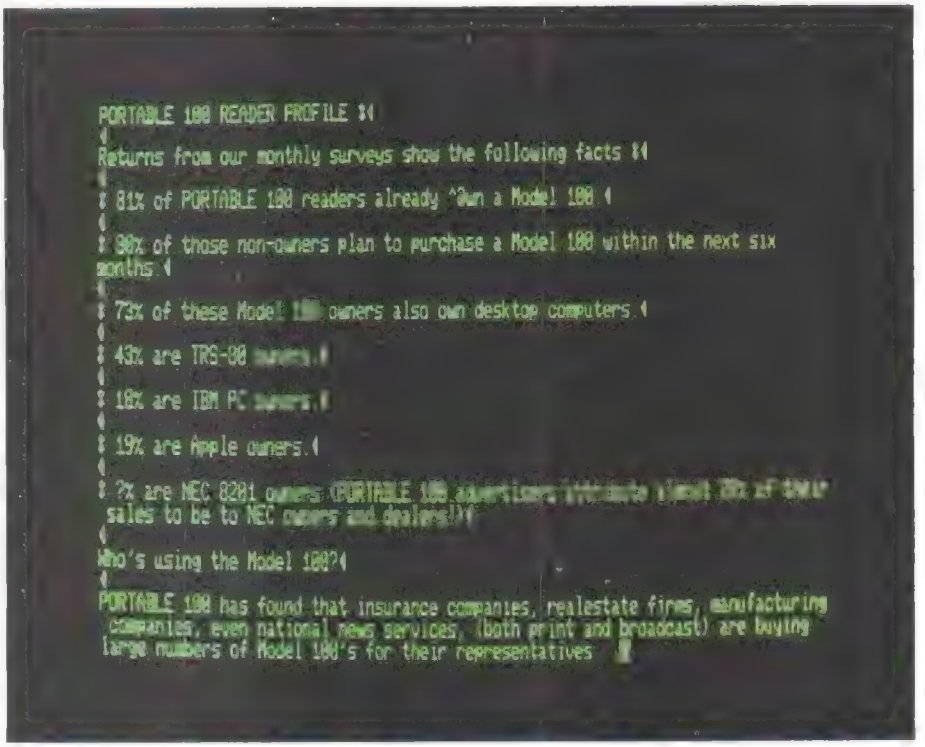


Photo 3. 80-Column display

BULLETIN

Kensington Microware Ltd.
251 Park Avenue South □ New York, NY 10010
(212) 475-5200 □ Telex: 467383 KML NY

Introducing REMOTE CONTROL The link between portable computers and your IBM PC.

When Radio Shack and NEC introduced their portable computers, we were impressed with their integrated software environments. Built-in text editing and communications software made these portables perfect travelling computers. But one thing was missing: an easy link between the portable and the office IBM PC. We went to work. The result is REMOTE CONTROL™ software.

Here's what REMOTE CONTROL software will do for you.

1. At the office: When you load REMOTE CONTROL on your IBM PC, you have an integrated text editing and communications environment. You no longer have to switch between word processing and communications programs. REMOTE CONTROL is modelled after the highly regarded software in the Radio Shack and NEC computers. If you have one of these portables, you'll find the command structure is identical. You don't have to learn any additional programs.

2. Direct connection: Move files at high speed over a standard RS232 cable between your IBM PC and your portable computer. Take your portable computer to a meeting and simply transfer your notes into your IBM PC when you return to the office. A null modem cable is included with REMOTE CONTROL.

3. Host mode: This is great. Now you can communicate with and control your unattended IBM PC over telephone lines from your portable computer keyboard. Move files, execute DOS commands and run stand-alone programs from your remote site as easily as if you were at your desk. For example: You're travelling with a portable computer. Late at night you dial your office PC with your portable. REMOTE CONTROL answers your call and gives you control over the PC. You can scan your disk drives for messages your office has left behind. You can download files into your portable computer. You can create messages with your portable and upload them to the office PC, save those messages to disk, even print the messages out on the PC's printer. Your correspondence is waiting for your office staff when they come in the next morning.

REMOTE CONTROL, only $180. Contact your local IBM dealer, or call us to order direct at 212 475-5200.

AVAILABLE SOON

1-TO-1™ with MCI Mail™
1-TO-1™ with Western Union EasyLink™

KENSINGTON™ MICROWARE

System requirements: REMOTE CONTROL runs on an IBM PC, PC-XT, or any IBM PC compatible with a minimum of 64K RAM.

trademarks: Remote Control — Kensington Microware Ltd., Radio Shack — Tandy Corporation, NEC — Nippon Electric Corporation, IBM — International Business Machines Corp
© 1984 Kensington Microware Ltd.

Circle No. 27 on Reader Service Card

HOLMES DRIVE: IS RELIABILITY AND RIGHT PRICE ENOUGH?

After surmounting production problems, the wafer drive arrives on the scene.

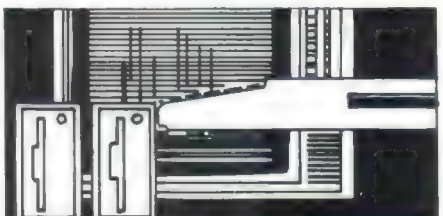
By JOHN P. MELLO JR.

Tandy Corporation has often been criticized for hiding its new products behind a stockade of secrecy and announcing them only when the product is in every one of its 11,000 stores. This practice may be rapped, but as to its wisdom...? Take the case of Holmes Engineering Inc.

Larry Holmes — president of that Salt Lake City, UT, firm — was one of the first third-party hardware vendors to pledge support to the 100. Using CompuServe's Model 100 SIG as a sounding board for his product, a portable wafer-tape drive, Holmes spent the summer whetting SIGers' appetites for his alternative to loathesome audio cassette storage.

When fall arrived, Holmes began promising delivery in October, then November. Finally, PMD-100 units began trickling from Holmes. While the hardware in the units was reliable, the software was abominable. Basic programs couldn't be stored to tape. If a tape had more than six files on it, the file names would scroll off the 100's liquid crystal display before they could be seen.

The trickle stopped. Holmes made some personnel changes and announced to SIG members it was developing a new operating system for the drive. Drives with the new system — one that could save Basic, ASCII, and machine-language files — began being shipped January 30, and owners of the original



HARDWARE

units were asked to return them for a free ROM upgrade.

So much for early announcements.

WHY WAFERS? According to Larry Holmes, wafer tape is the least expensive, most reliable means of mass storage for a computer. And who is going to argue with him? Tandy's disk-video interface sells for $799; the Portable Computer Support Group's 3.5-inch drive sells for the same price; while Holmes's wafer drive sells for $349.95.

But are wafers reliable? Texas Instruments and Coleco have trashed plans to use wafer drives with their computers. A report in the *Electronic News*, said TI scrapped its wafer drives after "reliability problems with the wafer tape design repeatedly delayed" release of its CC40 lap-sized computer. It added Coleco had similar problems with wafer drives in its Adam.

The weekly newspaper noted problems with the wafer drives, manufactured by Entrepo, included tape alignment and stretching, and vulnerability if tilted slightly when operating.

"Wafer tapes," Holmes told *Portable 100*, "are as reliable as magnetic media can get."

He explained: "TI and Coleco made the decision not to use wafer tapes for their own reasons. I can't believe that we would not have seen reliability problems by now if they were there."

"Even though all the tapes and drives we use say Entrepo on them," he added, "we actually get them from A&J Micro Drives, which is run by Bob Howell's son." Howell founded Exatron, which developed wafer technology.

"Entrepo bought Exatron," Holmes explained, "and since then, they have bungled the deals with Coleco and TI by sending them large evaluation lots of drives which were not even checked out before they were shipped."

Portable 100 worked with a wafer drive for two months and found no problem with reliability.

HARDWARE. The Holmes drive is a handsome piece of hardware.

It's compact (2.37 inches by 5.75 inches by 8.5 inches) and fits in cases designed to accommodate the 100 and Radio Shack CCR-81 tape recorder (like the cases made by Radio Shack and American Touristor).

All operating switches, plugs, LEDs, and ports are on the front panel of the drive, where they can be easily seen and used. The four LEDs tell the user when

Radio Shack's TRS-8
Now Offers Disk

The Revolution Continues

Our Model 100 Portable Computer's built-in software and easy portability started a revolution in the way America computes. Professionals of all kinds—managers, reporters, ambulance drivers—have found the Model 100 a valuable tool they can use anytime, anywhere. Now, with the new TRS-80 Model 100 Disk/ Video Interface, you can turn your Model 100 into a versatile disk-based home or office system, too!

Greater Storage Capacity and Faster Access to Data

The new Model 100 Disk/Video Interface features a built-in single-sided, double-density 184K disk drive to let you create, store and retrieve files quickly and easily. You'll find it much faster and more reliable than cassette storage. When you're ready to hit the road again, just load the files you need into your Model 100 and take off.

® Model 100 Computer
torage and Video!

Attaches Easily to Any Television

The Disk/Video Interface also lets you enjoy a big 40-character by 25-line screen display on any TV. The larger screen is perfect for writing notes and reports or developing your own programs in BASIC. When accessing data by phone, you can read a full 25 lines of information without scrolling. And you can utilize all of Model 100's graphics characters.

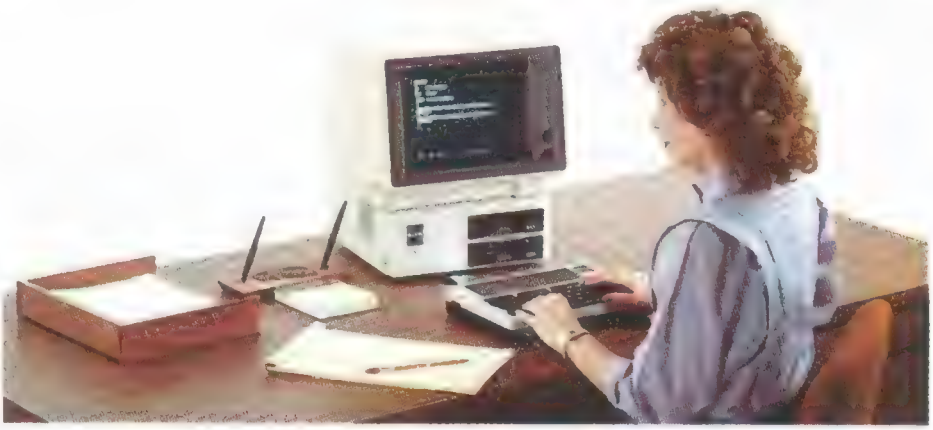
No Computer Wizardry Required

It couldn't be easier to use. Just plug the Disk/Video Interface into an AC outlet, connect your TV and a Model 100 with a minimum of 16K—all cables are included. One simple command switches all the output to the video screen. There's no new operating system to learn, either—the command structure is exactly the same.

Easily Expandable

You can add a second 184K disk drive (#26-3807, $239.95*) to the Disk/Video Interface for even more versatility. Best of all, the Disk/Video Interface doesn't use any of Model 100's standard connectors, so you can add a printer, bar code reader, RS-232C communications device or cassette recorder. You can make your Model 100 a high-performance desktop system.

TRS-80 Model 100
Disk/Video Interface
799.00
26-3806
Shown with optional second drive



Get Down to Business With an 80-Column Display

A Compact Office System

The Disk/Video Interface can turn your Model 100 into a professional desktop system for the office, too. With any standard video monitor, you get a large 80-character by 25-line display that's equal to other desktop computers. You'll also get the rapid access to files and storage reliability that are so necessary in today's business world.

Perfect "Second System"

A disk-based Model 100 system is an economical alternative to a second office computer. And you'll still have the advantage of portability when you need it.

Circle No. 28 on Reader Service Card

AS LOW AS $45 PER MONTH

Come In Today

The TRS-80 Disk/Video Interface, along with our complete line of Model 100 accessories, is available coast to coast.

Available at over 1100 Radio Shack Computer Centers and at participating Radio Shack stores and dealers

Radio Shack®
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

Send me the all-new TRS-80 Catalog RSC-11.

Mail To: Radio Shack, Dept. 84-A-799
300 One Tandy Center, Fort Worth, TX 76102

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
TELEPHONE _____

*Installation not included. Prices apply at participating Radio Shack stores and dealers. TRS-80 Model 100, Disk/Video Interface and TV sold separately. CitiLine is a service mark of Citicorp

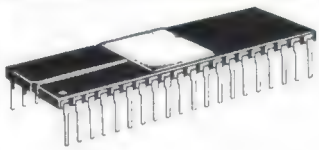
Circle No. 29 on Reader Service Card

8K RAM MEMORY MODULES

EXPANSION RAM FOR TRS-80
MODEL 100 PORTABLE COMPUTER
NEC 8201 COMPATIBLE

$64.95 EACH
3 OR MORE $59.95 EACH

△ EXACT REPLACMENT
△ EASY TO INSTALL
△ INSTALLATION INSTRUCTION INCLUDED
△ HIGH QUALITY MANUFACTURING
△ WARRANTY INCLUDED



PG DESIGN ELECTRONICS
66040 GRATIOT
RICHMOND, MICH. 48062
313-293-6639

DEALERS INQUIRIES WELCOME
TRS-80 is a trademark of TANDY CORP.

"LUXURIOUS GENUINE PIGSKIN CASES"

Show off your new portable computer in one of these beautiful European-style carrying cases. Made of the finest handpicked pigskins, these custom bags are **stain and water resistant**. They are fully lined and will give you lasting beauty since pigskin is more durable than leather or even vinyl. Indulge yourself and show everyone you appreciate the finer things in life. It's "IN THE BAG!"

Classic	$49.95
Continental	59.95
New Yorker	59.95
*Custom Bag Special Price	

Allow 2-3 weeks for delivery.

Mail Check or Money Order
TO: IN THE BAG, INC
P.O. Box 1154
El Toro, CA 92620
For further information call direct 714/837-2035

Include $4.00 Shipping. California residents add 6% Sales Tax.
Dealer inquiries welcome

the drive is active, writing to disk, or its power supply is full or low. The link between the 100 and the drive is a coiled connector. It resembles a telephone cable and has a phone-type modular plug on one end and an RS232 D connector on the other.

Esthetically, the drive looks like it *belongs* with the 100.

POWER. Power for the PMD-100 comes from a high-capacity gel cell inside the unit. The battery can be recharged using an AC adapter provided by Holmes with the unit. In a wise move, Holmes provides a connector enabling the 100 to be powered by the wafer drive, thus the 100's alkaline batteries can be conserved.

When recharging the drive, the plug-in sequence is crucial. The AC adapter is first plugged into the drive, then into the wall socket. If the reverse is done, the drive may be damaged. According to the PMD-100's documentation, the odd adapter used by Holmes prevents it from being plugged into the 100 by accident. If that happened, the 14-volt adapter would fry the insides of the computer. "We felt it was better to risk ruining the [adapter]," the manual states, "than risk ruining the 100."

Don't worry about overcharging the drive. The recharging circuit senses when the battery is full and reduces the charging to a trickle, protecting it from overcharging.

The drive's power supply stays charged for about four hours of continuous use. Even when the drive is on, it will "sleep" when not being used. This reduces power consumption considerably.

However, I've left the drive on overnight, and found it suspiciously out of power in the morning.

Also, if the drive enters sleep mode while you're trying to save or load a file, the drive won't wake up. You have to leave the program and reenter it to reactivate the drive.

LOADING WAFER.CO. To enable a 100 to "talk" to the drive at 9600 baud, software in an EPROM in the PMD-100 must be loaded into the computer. Because the software is in an EPROM, it can't be destroyed and can be reloaded into the 100 whenever it's needed.

The software is loaded through the RS232 through TELCOM. After Stat is set to 88E1E, enter Term. Set the 100

Circle No. 30 on Reader Service Card

to download a file called "Boot." When Down is in reverse video, hit B and the PMD's operating system will load. Two beeps signal the end of the download. This takes about 21 seconds. Enter BASIC. Run "Boot." And a machine-language program will be POKEd into the 100's high memory in 54 seconds. Kill BOOT.DO and return to the menu. The operating system — WAFER.CO — will be waiting there. It occupies 4260 bytes in the 100.

Although I didn't have any problems loading the operating system with the original version of the drive, I occasionally got bad loads with version 1.31. This included garbage characters being loaded with the boot program.

I also found version 1.31 wouldn't read tapes written by the original version of the system.

OPTIONS. The 100 enters WAFER.CO as it does any program — place the cursor over the file and hit enter. A menu with the following options appears:

- Save to tape;
- Catalog tape;
- Format tape;
- Quick save;
- Load from tape;
- Exit from program;
- Delete last file; and
- M-100 files free

Save lets the 100 write machine-language, Basic, and document files to the drive. Both saves and loads with the drive are slow (see table 1). The saving grace is you can be sure you're going to get back what you saved.

Load sends the file to the computer from the drive.

Catalog tells the drive to read the tape directory at the beginning of the tape. Unlike earlier editions of the operating system, the files don't scroll off the screen before you can read them. Five of them and their lengths are listed on the screen. Five more appear by hitting enter.

Exit returns the 100 to its main menu. It signals the PMD to power down.

Format erases a wafer tape and prepares it for storage. Like floppy disks, a wafer must be formatted before it can be used in the drive.

Delete erases the last file on the wafer. Since files are stored sequentially, it isn't practical to delete files anywhere on the tape, as with disk drives.

Quick save sends a file to the drive and releases the 100 for further operation. As the table shows, this saves time

DATACCOUNT

2 for the money

TAX PREP
(for individuals)
&
TAX PLAN
(for professionals)

software designed
specifically for
Tandy Model 100
&
NEC Model PC-8201 *

TAX PREP helps you prepare 1983 taxes including schedules 1040: A, B, G, SE, and W.

TAX PLAN includes 3 versions: 6K, 10K, and 15K for 1983 and 1984 tax years; enables you to compute tax schedules or tables, income averaging, capital gains, alternative minimum tax, and schedules A, SE, and W and provides the ability to save and recall client data.

* Marketed by NEC

DATACCOUNT
516 S.E. Morrison, Suite 820
Portland, OR 97214
(503) 232-0490

Circle No. 31 on Reader Service Card

BAKER'S DOZEN

13 Power Packed Programs Model 100 (8K +)

BUSINESS

Mailing List — Prints on labels, creates ADRS.DO files works with ADDRESS program
Calculator — 16 digit accuracy, has a %, square root and memory functions
Loan Payment Calculator — Gives total

GAMES

Yahtze — Fashioned after the popular dice game, built in score (1 to 3 players)
Yahtze Score Card Generator — Prints score cards for Yahtze (printer required)
Jotto — Use your logic and skills to guess the correct word (1 to 2 players)
Bingo — Calls random bingo numbers
Boggl'e — Fashioned after the popular dice game (1 to 4 players)
Charades — Has a timer (For 2 teams)

EDUCATION

Vocabulary — Allows creation and testing of words and their definitions (uses RAM files for storage)
Spelling Practice — Drills students on a list of spelling words (uses RAM files)
Math Practice — Drills students on + − and ×, with 3 levels of difficulty

PRICE — $24.95

Less than $2.00 per program/Instructions
Please add $2.00 for shipping & handling
Pa residents add 6% sales tax.
Phone orders (COD) accepted

BILLCOMP SERVICES
RD#1 Box 151 B • Corsica, Pa. 15829
814-764-5158

Circle No. 32 on Reader Service Card

Circle No. 33 on Reader Service Card

AUTOPLOT for the TRS-80

MODEL 100 (16k+)

and the **CGP-115** Color Graphic Printer

A picture is worth a thousand words. Now you can produce color graphs of professional quality effortlessly in minutes wherever you go. Plot tabulated data or functions. Choose from line graphs, scatter plots, bar graphs and more. Axes are automatically scaled and labelled. A few keystrokes select from many options, such as plot size, continuous curves and/or separate marks, multiple curves, optional grid overlay, linear or log plots, numeric integration or differentiation. . . A label-maker program lets you add fancy titles or legends. **AUTOPLOT** is written in BASIC and comes on cassette, together with an exceptionally clear 28-page manual.

Why such a small ad for such a fantastic program? By keeping down our overhead, we can offer you **AUTOPLOT** at the unheard-of introductory price of $49.50

Also available

AUTOPLOT for TRS-80 Model I/III (48k, 1 disk and CGP-115 ..$69.50

AUTOPLOT for TRS-80 Model I/III and EPSON printer with Graphtrax...$79.50

AUTOPLOT for LNW-80 (+ Hi-Res video graphics) ..$99.50

Please add $3.00 for shipping and handling. CA residents please add sales tax. Phone orders, VISA and MASTERCARD welcome.

MENLO SYSTEMS

3790 El Camino Real, Suite 221

Palo Alto, CA 94306, Tel (415) 856-0727

TRS-80, CGP-115 TM of Tandy Corp.

ASSEMBLER

An 8085 assembler for the Model 100. Use the built in TEXT program to create the source code. The full use of labels are supported, as are the following psuedo-operations:

DEFM	DEFB	DEFW	DEFS
ORG	EQU	$	END

Tape $22.95

LETS PLAY MONOPOLY

Match wits with your Model 100!! Plays just like a real game. Fast machine language graphics and sound effects.

Tape $29.95

CUSTOM SOFTWARE
605 North C, #2
Wellington, Kansas 67152
316/326-6197

VISA MasterCard

Circle No. 34 on Reader Service Card

saving a file. The catch is, the drive can't send any error messages to the 100 if something goes wrong when it tries to write the file to disk. However, if there is a foul-up, the drive's write light will blink and the device won't power down.

M-100 files shows the files in the 100 and its memory free for use.

DOCUMENTATION. The drive comes with an 18-page manual. It's easy to understand, but a sub-par printing job makes the documentation difficult to read.

Throughout the manual, Holmes stresses the need to protect wafers from foreign matter. Yet the firm furnishes the wafers in a throwaway plastic wrapper. A more permanent plastic case for the wafers would benefit the user.

A major drawback of the drive is it can't be accessed from BASIC. This limits the drive's ability to increase the 100's power by providing a storage medium for data bases or other programs running on the 100.

Despite its drawbacks, the PMD-100, at its price, is a good and reliable alternative to cassette tape.◀

WAFER-AUDIO TAPE COMPARISON

	PMD-100 WAFER			CCR-81 AUDIO TAPE
WAFER SIZE	**10'**	**20'**	**50'**	
OPERATION/ BYTES IN FILE	**TIMES IN MIN.: SEC.: 1/100 SEC.**			
SAVE				
931[1]	00:43:09[2]	01:11:01	02:32:90	00:13:01[3]
1089	00:40:15	01:17:22	02:39:29	00:28:59
3923	00:47:33	01:18:78	02:41:88	01:26:51
LOAD				
931	00:20:75	00:44:43	01:18:06	00:13:04
1089	00:19:90	00:45:15	01:21:76	00:27:53
3923	00:29:51	00:49:39	01:26:15	01:25:67
QUICK SAVE[4]				
931	00:02:82	00:02:51	00:06:72	
1089	00:02:37	00:03:18	00:03:17	
3923	00:03:90	00:06:70	00:07:08	
DELETE				
931	00:18:53	01:07:69	01:15:10	
1089	00:17:38	01:08:12	00:55:17	
3923	00:18:55	01:08:43	01:15:15	
FORMAT[5]	00:42:94	01:28:27	03:23:98	
CATALOG[6]	00:04:59	00:17:80	00:37:24	

[1] Basic file; two other files document files.
[2] Time includes verify file, write to tape, update directory.
[3] Times for save or load only.
[4] File must be 12K or less.
[5] If tape is unformatted, it can take up to 2 minutes before error message appears.
[6] There was a 4 byte discrepancy between file lengths listed in catalog and lengths listed in save mode.

BENDER'S BETTER WAY TO BETTER BASIC — 4

In Gary's final installment, he discusses branching statements and sorting.

By J. GARY BENDER

In Part 2, I pointed out subroutines execute faster when placed at the beginning of a program.

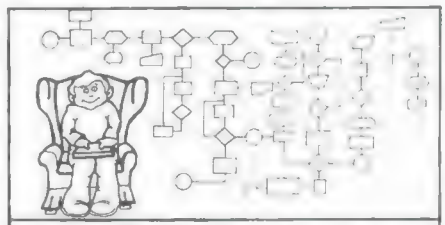
Goto's have the same problem. Any branch to a specific line number causes Basic to perform a search.

A few branch instructions don't need a search. Return and Next don't specify a line number. Basic remembers where the subroutine or loop is located and automatically returns back to the proper location. In the case of the subroutine, this means execution time isn't sensitive to where the subroutine statement is located, only its target.

Loops provide an interesting opportunity to improve some program structures. A frequent requirement in programming is to execute a loop *while* a certain condition is true. The requirement is so universal that many modern languages include a while statement. (Microsoft Basic on the Model 4 has a While-Wend loop structure).

For-Next loops can simulate While loops and a similar loop structure, Repeat-Until. The while statement tests for a true condition at the top of the loop. Repeat-Until performs the test at the end of a loop. On the 100 and all TRS-80 Microsoft Basics before the Model 4, a For-Next loop is a special form of the Repeat-Until. The loop always executes once and the test is at the end of the loop.

MODIFY. It may sound like I'm complicating a For-Next loop, and in some cases that would be true. You often don't need to get tricky, but as soon as you catch yourself using a Goto (or



PROGRAMMING

Then or Else) to complete a loop, consider using a modified For-Next loop.

Chances are you already have used the While structure of a For loop without realizing it. Any time you branch out of a loop prematurely, you've modified the pure For-Next loop, and I'm suggesting you intentionally do so for a better reason than convenience.

THE MECHANICS. Let's look at how a For-Next loop works. When Basic encounters the For statement, it first evaluates the index limits. It only does this *once*.

Why do I stress once? Because you probably don't have to worry about calculation time for the limits:

```
FOR P=PI TO 100*PI STEP PI
```

The time to calculate 100*PI will hardly be noticed since it's only done once. For speed, the above would be preferred to:

```
FOR K=1 TO 100 : P=K*PI
```

FEATURES. On the other hand, the second version will be slightly more accurate towards the end of the loop. (The first form repetitively adds PI to P; the second multiplies a new value of P each time.) This implies one capability and one restriction that might not be obvious:

- The index can initialize itself.
- You can't change the termination value once you've started the loop.

The index can initialize itself like this:

```
K=10
FOR K=K TO 100
```

The first value of K in the loop will be 10. The reverse is *not* true, however.

```
FOR K=1 TO K
```

won't work, since K will be initialized to 1 before the limit is calculated. The following will execute 10 times:

```
J=10
FOR K=1 TO J: J=5: PRINT K;: NEXT
```

GOOD FOR WHAT? Now the question becomes what can we do with these features? One use is when you're scanning a long set of values, you can use the index in a way similar to the "from character" value in the in-string (INSTR) function, leaving the loop and reentering it later with the index starting where you previously stopped. You also can use the index of one loop to set the limits for an imbedded loop.

After evaluating the index limits, Basic makes a note of where the statement following the For is located in memory. Any time it encounters a Next, it immediately can branch back to the first executable statement in the loop. That is why a For doesn't have to be the first statement on a line.

A good use of the latter is to prevent a loop iteration when the limit is lower than the start value. (Model 100 Basic would otherwise execute the loop once.)

```
IF EN > 0 THEN FOR I=1 TO EN
```

will only execute the loop if EN is greater than zero. Putting a test before a loop can prevent errors when dealing with arrays. That particular example only works if the loop fits on one line. If the loop covers several lines, you'll have to branch around the entire loop with the Then clause and put the For after an Else:

```
10  IF EN < 1 THEN 90 ELSE FOR I=1 TO
    EN...
80  NEXT
90  ....
```

The Next statement increments the index (by 1 or the Step size) and tests against the limit. If the index has not exceeded the limit (considering the sign of the Step), an immediate branch back to the statement following the For is made. Otherwise, Basic drops through to the statement following the Next.

The index *always* will be beyond the limit value (again, considering the sign of Step). In other words, FOR K=1 TO 10 will leave K=11 if the loop runs to completion. (You don't branch out of it early.)

YOU CHOSE. There are two easy ways to use loops in a While or Repeat-Until fashion. Which is best for a particular need will depend upon the test conditions for either continuing or terminating the loop and whether or not the loop index is participating in the calculations.

For example, let's assume you want to read characters from a file one at a time until you read an "@" sign. All characters before the "@" are to be ignored. The three examples below will do the same thing:

(1)
```
1000 IF EOF(1) THEN 1100
1010 A$ = INPUT$(1,1)
1020 IF A$= "@" THEN 1030 ELSE 1000
```

(2)
```
1000 FOR K=1 TO 255
     : IF EOF(1) THEN 1100
1010 A$ = INPUT$(1,1)
1020 IF A$= "@" THEN K=998
1030 NEXT
```

(3)
```
1000 FOR K=1 TO 1
     : IF EOF(1) THEN 1100
1010 A$ = INPUT$(1,1)
1020 IF A$<> "@" THEN K=0
1030 NEXT
```

WHAT IT MEANS. Examples (1) and (3) are both infinite loops. They will go on forever, or until the end-of-file or an "@" character is encountered. Examples (2) and (3) will run faster because the Next immediately will branch to the if-end-of-file statement. Line 1020 of example (1) will cause Basic to search for line 1000, and (2) and (3) take advantage of the fact a loop index is just like any other variable.

By resetting K to 0 you prevent it from ever exceeding 1 (the limit) and the loop continues forever. When you find the "@" sign in example (3), you let the index increment normally and terminate the loop.

Example (2) offers some additional safety. The loop index will prevent a lock up should something unexpected happen in the file system. When you find the "@", you force K to a value greater than or equal to the limit, which will terminate the loop. Using a high value, like 998, will leave K equal to 999 upon exit. That makes it easy to test for a "hit". A K will be 999 for a Hit and 256 for a Miss.

BASIC EQUIVALENCY. Deciding which method to use is up to you and any other constraints the application or system imposes. In general: (1) is the smallest; (2) and (3) are the fastest; (2) is the safest and best overall choice.

You might want to apply these structures to some of the loops presented in the Basic Template subroutines from Part 2. This month's new routines do make use of the above techniques. Notice both of the definitions allow the loop to terminate rather than just branching out of it. The 100 doesn't seem to care, but some machines do (the Color Computer, for example.) The stack starts to fill up and eventually consumes all of memory. It's a good practice to let the loop think it finished normally.

SORTING ARRAYS. Sooner or later you're going to want to sort something in one of your programs. It may be a mailing list, a set of check numbers, or just a list of values. I've included two short sort routines for the Basic Template for my grand finale. If you missed the Basic Template (Part 2, March 1984) you can still use the routines.

Lines in the 100-199 range can be ignored if you don't use the template. Lines in the 2000-plus range are for initialization and should be executed before using either sort routine. The sort routines themselves are in the 600 to 699 block.

The difference between "sort%" and "sort$" is the former is an integer sort and the latter a string sort. If you need to sort real numbers (either single or double precision) you can pattern a sort after the "sort%" routine. Both routines are the Shell Sort algorithm to sort either an integer or string array (single-dimensioned).

Enter CompuServe's Electronic Mall™ and shop at your convenience in these exciting departments.

The Micro Mart
The Department Stores
The Travel Agent
The Book Bazaar
The Record Emporium
The Photo Booth
The Software Shop
The Financial Market
The Magazine Kiosk
The Gardening Shed
The Newsstand

A sample of the companies participating in CompuServe's Electronic Mall™ includes:

Amdek
American Airlines
American Express
AST Research
Bantam
CBS Publishing
CDEX
Colonial Penn
Commodore
Computer World
Digital Equipment
dilithium Press
800 Software
Heath
Hertz
E.F. Hutton
Inmac
Innovative Software
Magazine Supply House
Manufacturer's Hanover Trust
McGraw-Hill
Metropolitan Life
Microsoft
Miracle Computing
Misco
Newsnet
Official Airline Guide
Pan American Electronics
Peachtree Software
Practical Peripherals
Program Store
Professional Color Labs
RCA Record Clubs
Record World
Sears
Select Information Exchange
Sim Computer Products
Software Advisor
Stark Brothers
Supersoft
Max Ule
Vanguard
VisiCorp
Ziff-Davis

Merchants and manufacturers who want to participate in the Electronic Mall™ may contact: Stephen A. Swanson, L.M. Berry & Co., P.O. Box 6000, Dayton, OH 45401, (513) 296-2015.

BY THE YEAR 2000, THE WORLD MAY CATCH UP WITH THE WAY COMPUSERVE'S NEW ELECTRONIC MALL™ LETS YOU SHOP TODAY.

Introducing the first computer shopping service that brings you convenience, savings and enjoyment.

Here's your chance to expand the practical uses of your personal computer.

Sign up for CompuServe and shop in our new Electronic Mall. It's easy to use. It tells you more about the products you're buying. It lets you order faster. And it's totally unique.

CompuServe's new Electronic Mall™ offers you all these shopping innovations.

– It's enormous! So it gives you in-depth information on thousands of goods and services, and lets you buy even hard-to-find merchandise. – Its unique "Feedback" service lets you ask the merchants themselves specific questions. – It's incredibly efficient in ordering the products and services you want. – Its special discount opportunities make it economical, purchase after purchase. – And its name-brand merchants assure you of top-quality merchandise.

Make the CompuServe Electronic Mall 15-Minute Comparison Test.

What you can do in 15 minutes shopping the Electronic Mall way.

- Call up on your computer screen full descriptions of the latest in computer printers, for instance.
- Pick one and enter the order command.
- Check complete descriptions of places to stay on your next vacation.
- Pick several and request travel brochures.
- Access a department store catalog and pick out a wine rack, tools, toys... any thing!
- Place your order.

What you can do in 15 minutes shopping the old way.

- Round up the family and get in the car.

The Electronic Mall, a valuable addition to the vast world of CompuServe.

CompuServe's Consumer Information Service brings you shopping information, entertainment, personal communications and more.

You can access CompuServe with almost any computer and modem, terminal or communicating word processor.

To receive your illustrated guide to CompuServe and learn how to subscribe, call or contact...

CompuServe

Consumer Information Service
P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, OH 43220

800-848-8199

In Ohio call 614-457-0802

Circle No. 35 on Reader Service Card

H & R Block Company

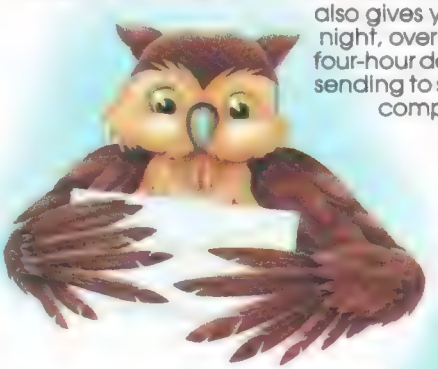
There Are So Many Ways To Get Wise After Dark

With even more databases and convenient new shopping and mail services, there are more good reasons than ever to subscribe to BRS/AFTER DARK. It's the most powerful and comprehensive online information service available!

Want help with your taxes? Tips on choosing a college? Maybe you'd like to browse through abstracts of literally thousands of magazines, or look up a reference in the full text of the Academic American Encyclopedia. It's all available on AFTER DARK, along with practical information on dozens of other general and special interest subjects.

You'll have access to comprehensive online databases covering the social sciences, biology, chemistry, engineering, medicine, business and education. These are the identical files used by major reference libraries and corporations around the world. In addition, there are many new databases on subjects ranging from computer education to software evaluations to robotics. And for the first time, you'll be able to order hard copies of any document found in your online search.

Imagine being able to send a letter or message instantly to anyone anywhere from coast to coast, with delivery in the time span you specify. That's the convenience and economy of MCI, the "Nation's New Postal System," and it's now available to AFTER DARK subscribers. Light years more sophisticated than other terminal-to-terminal services, MCI Mail also gives you options of overnight, overnight-by-noon and four-hour delivery. And if you're sending to someone without a computer, you can even have MCI print the message on their high speed laser printer and mail it from the nearest city!



With BRS/AFTER DARK, you can transform your living room into a university library, a personal post office or even a shopping mall. Discover our new Shop At Home Service that lets you "window shop," order online—and save 20% or more—on everything from a software package or a magazine subscription to your favorite tape or recording. All without leaving home!

There's simply no time wiser, more informative, more profitable or more fun than AFTER DARK. Use the coupon to sign up before another evening goes by!

BRS AFTER DARK
An ITG Company

Clip & Mail To: BRS/AFTER DARK, 1200 Rt. 7, Latham, NY 12110

Circle No. 36 on Reader Service Card

☐ Please sign me up as a BRS/AFTER DARK subscriber right away! I understand I will be charged a one-time subscription fee of $75 plus connect hour rates as low as $6 per hour, with a monthly minimum of $12 billed to my credit card account.

Charge to my: AMERICAN EXPRESS/MASTERCARD/VISA
(circle one)

Acct. No. _____ Exp. _____

Signature: _____

☐ I'd like to know more! Please send me a list of databases and a brochure describing BRS/AFTER DARK.

NAME _____
(please print)

ADDRESS _____

CITY _____ STATE _____ ZIP _____

NYS Residents please include:
County _____ OR Tax Exempt No. _____

PHONE NO. ( ) _____

P100 5/84

SHELL SORT. This sort offers a reasonable compromise between speed and complexity. The routines are slightly modified versions of the Shell Sort presented in *Software Tools* by Kernighan and Plauger.

The input arrays aren't sorted, instead a vector of subscripts is returned. The values in ZV%() are the sorted subscripts of the input array. The general name of this type of sort is a "sort-by-pointers."

More often than not you have several arrays that are related. The one you sort is the key, but you also want to reference the other arrays according to the same sort. A sort-by-pointers gives that ability.

This will become clearer as we get down to the samples. If you want the original array physically sorted (sort-in-place), use the normal sort and follow it with a call to "reorder%" or "reorder$". If you have several related arrays, you'll have to call "reorder" for each array. You'll probably have to make a few modified versions of the "reorder" routines to meet all your needs. That still beats having to wtite everything from scratch.

STRING POINTERS. The string "reorder$" uses some system knowledge to make it more efficient for handling strings. Basic stores information about string arrays (all strings, actually) in two different places. A set of pointers (Basic's internal memory pointers, not the subscripts of sort-by-pointers) are stored in the same area used by other variable types.

These pointers indicate where the actual character strings are stored. By very carefully manipulating the string pointers, it's possible to sort a string array without moving the strings.

I strongly advise you not to modify the code for "reorder$" unless you're absolutely sure you know what you're doing. Since "reorder$" uses POKES, and one bad POKE can wipe out your entire system and force you to cold start; you could lose everything you had stored in RAM. Also, you *must* leave the initialization code in line 670 if you use "reorder$".

I can't overstress the cautions in the preceding paragraph. Read it again and *believe it*!

Z-ARGUMENT. You call either sort with one Z-argument; ZN% is the number of elements to sort. For example, if you have 100 names in array ZS$(99):

```
2000 ZQ$ = "sort$"
     :ZN% = 100 : GOSUB 100
```

The routines assume ZS%() or ZS$() arrays are the input. You either can move your actual array into ZS() or you can modify the sort routines to use a different array name. The vector returned in ZV%() will be the subscripts of the input array in sorted order. In other words, to see ZS%() in order look at the elements like this:

```
ZS%(ZV%(1))
ZS%(ZV%(2))
...etc.
```

THREE BYTES LONG. While you're trying to figure out how "reorder$" works (You will try, won't you?), it may help to know that each element of the string array pointer block (at the address returned by VARPTR) is three bytes long.

The first byte is the string length and the next two are the address of the first character of the string in memory. Basic doesn't mind if two string variables point to the same string – that feature is used to make the comparisons.

The last vital consideration with this type of fast string sort is that you mustn't move anything in the string storage area. Doing so could cause a garbage collection – disaster to the sort, and maybe to the system.

NOT FOR KICKS. I hope I made my point! Don't mess around with it for kicks.

Also, check and recheck that portion of the code when you type it in. Of course, if you're following my recommendations from Part 1 of the series, you won't loose anything important because everything is backed up on tape . . . right?

ASSOCIATED VALUES. More often than not, an array will be associated with other data in parallel arrays. The vector returned in ZV%() contains the subscripts of the original ZS() array that would have put the array into sorted order. You can use the ZV%() vector to locate associated values in other arrays.

For example, let's say two associated, parallel arrays CK%(200) and CK!(200). CK%() is the check number and CK!() is the amount. By parallel, I mean the check number in CK%(25)

Circle No. 37 on Reader Service Card

MODEL 100 & NEC
PORTABLE SOFTWARE

SCRIBE 3.0 – WORD PROCESSOR – 2.1K

MENU CONTROL WITH DEFAULTS FOR EASY OPERATION. STANDARD PICA, ELITE AND MICRO TYPE FORMATS. WORD PROCESSING WITHOUT COMMANDS EXPANDED POWER WITH EASY TO REMEMBER COMMANDS TO: RESET LINE LENGTH, MARGINS AND INDENT; CENTER AND PRINT DOUBLE WIDTH TITLES; SEND PRINTER CODES; INPUT FROM KEYBOARD; TURN RIGHT JUSTIFICATION ON AND OFF; SKIP LINES; START NEW PAGE; AND INSERT COMMENTS PAGINATION, HEADINGS AND NUMBERING MULTIPLE COPIES AND PERSONALIZE FORM LETTERS. BUFFERED TYPEWRITER OPERATION. PRINT FROM A COMBINATION OF RAM, TAPE AND KEYBOARD. VARIABLE LINE SPACING CONTINUOUS FORMS OR CUT PAPER COMPUTES TEXT LENGTH. CUSTOMIZE FOR DOT MATRIX OR OTHER PRINTERS. PRINT QUALITY SELECTION. TAPE WITH 14 PAGE MANUAL

BOOK – BOOKKEEPING – 2.8K/3.8K

SINGLE ENTRY BOOKKEEPING FOR SMALL BUSINESSES, PROFESSIONALS AND SELF EMPLOYED PERSONS SYSTEM OF 52 ACCOUNTS BASED ON TAX FORM 1040 SCHEDULE C EXPANDED TO INCORPORATE TRAVEL EXPENSE ACCOUNTING REVIEW FINANCIAL STATUS AT A GLANCE. PRINT SUMMARY STATEMENT AND ENTRIES BY ACCOUNT MENU CONTROL WITH PROMPTS. TAPE WITH 12 PAGE MANUAL

$29.50 EACH

PLUS $2.00 MAILING AND HANDLING

CHATTANOOGA SYSTEMS ASSOCIATES
POST OFFICE BOX 22261
CHATTANOOGA, TN 37422

DEALERS INQUIRE

Circle No. 38 on Reader Service Card

THE SOLUTION
TO
CHECK CONTROL
CHEQUE
WRIGHT

- Quickly find your current balance
- Easily reconcile your account
- Sort on any field
- Works with an 8k machine
- Reports formatted for the display
- Reports formatted for the printer
- Your data can be located from and saved to rs-232 modem, and cassette

$19.95

MICRO HELP
4009 Pacific Coast Hwy
Torrance, Ca. 90505

SHIPPING AND HANDLING IS INCLUDED
CA RESIDENTS MUST ADD TAX.

refers to the amount in CK!(25).

In a real checkbook application, you'd have other parallel and multi-dimensioned arrays including date, who to, and what for. To sort by check number:
(Assume you changed ZS%() to CK%() in the "sort%" routine
and you dimensioned ZV% to at least the size as CK%())

```
3000 ZN%=NC% ' NC% is the actual
     # of checks in the array
3010 ZQ$= "sort%" :GOSUB 100
3020 REM now print the check # and
     amount in sorted order
3030 FOR K=1 TO NC% : PRINT
     CK%(ZV%(K)), CK!(ZV%(K))
3040 NEXT
```

The reference to the proper CK!() value is obtained indirectly by using the original subscript of CK%() before the sort. If you want the two arrays physically reordered into sorted order, you will have to make a "reorder!" version of the reorder routine and:

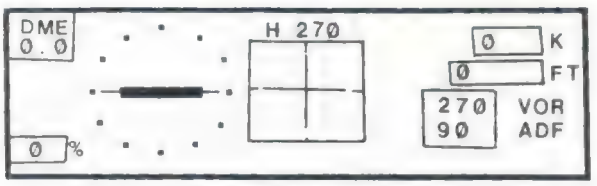
```
3100 ZQ$ = "reorder%" :GOSUB 100
3110 ZQ$ = "reorder!" :GOSUB 100
```

NO ALTERATIONS. The "reorder!" routines don't alter the ZV%() vector, so you can use it to reorder as many arrays as necessary. Remember the reorder routines are expecting a certain array name.

In the real world, you probably won't reorder arrays as much as you may think. Typically, you store the data on tape or in a file. The time to reorder is while you're writing out the updated data file, like in the above example (line 3030). Since "reorder!" doesn't suffer from the critical crash potential "reorder$," you can modify it to fit your needs without worrying about destroying RAM files.

BUILT-IN TOOLS. I don't think I need to dwell on programming tools too much, but they are worth a reminder. The 100 has some nice tools to help the programmer that may escape new users:

- You can move lines of code by changing the line number while in Edit. Basic will *merge* the lines from an Edit session like it was coming in from a file. This feature also is a hazard. Don't accidentally change a file number!
- You can duplicate lines of code while in Edit. Just select (F7), Copy (F5), and Paste. Change the line numbers of the copied code and you've got it.
- You can enter code in lowercase. Basic will convert its keywords to uppercase. I like to enter my changes in lowercase so I can clearly see what I did.
- Since Basic is an interactive interpreter, you can use Basic commands to help you debug the program. If an array goes out of bounds, print the values that are used to compute the subscript. Don't forget that you often can fix the bad value and continue the program from where the error occurred by using the direct statement form, like K=4, without a line number.
- Direct statements also are nice for trying short pieces of code that will fit in about 250 or less characters.
- Ever have a program go off into never-never-land and you're not sure if it is running or crashed the system? You won't hurt anything if you Break. Basic is smart enough to finish its cur-



PILOTS !

MODEL 100 INSTRUMENT TRAINER
PROVIDES REALISTIC SIMULATION
OF THESE APPROACHES:

ILS	ADF
VOR/DME	LOCALIZER
TACAN	BACK COURSE

ANALYZE YOUR PERFORMANCE WITH POSTFLIGHT PLAYBACK OF GROUND TRACK AND GLIDEPATH.

REQUIRES 24K MODEL 100 AND CASSETTE PLAYER.

INCLUDES INSTRUCTIONS, PRACTICE APPROACHES AND CASSETTE.

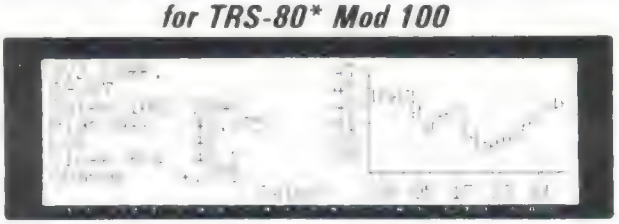
$29.50 + $2.00 POSTAGE

POCKET PROGRAMS
BOX 1568
SPRING, TX 77383

Circle No. 39 on Reader Service Card

TELE-STOCK™

STOCK MARKET DECISION ASSISTANCE
for TRS-80* Mod 100



12 to 24 hours ahead of the newspaper at less than the cost of the newspaper Your Model 100 automatically calls the Dow Jones News Service immediately following the close of the market each day, retrieves the market activity for your investments (it takes about 1 minute and cost 15-30 cents), then displays and prints for each investment:

- *Todays Activity*
- *Return on Investment*
- *45 day historical graph showing HIGH, LOW, CLOSE, VOLUME*

IMPROVE YOUR INVESTMENT PERFORMANCE

for only $59.95 on cassette with manual. Send check money order or VISA MC number with expiration date to

Skyline Marketing Corp.
4510 W. Irving Park Rd.
Chicago, IL 60641
(312) 286-0762

MODEM ORDER LINE (312) 286-9015

*Requires 24K Model 100 with direct connect or acoustic cable

*TRS-80 is a trademark of the Tandy Corporation

add $2.00 shipping and handling per order

Skyline MARKETING CORP.

Circle No. 40 on Reader Service Card

rent instruction before allowing the break. You can look at values with print statements. If needed, fix values and type CONT to let the program continue.

MORE? Part 5? Not for awhile. Give me a chance to play with my machine! This is by no means the end of nifty little tricks and tools for working with the Model 100. I'll be back with more subroutines and other random ideas.

In the meantime, I hope this short series has pointed you in the right direction with your programming efforts and made it easier for many others. Let me quote myself from comments made previously in this series: "Write it for someone else to read. . . . Plan for your debugging sessions." And of course, enjoy that fantastic little gadget! ◀

```
  1 REM SORT Subroutines -- add to
    Basic Template, or use stand
    alone
161 IF ZQ$="sort%" THEN 610
163 IF ZQ$="sort$" THEN 630
165 IF ZQ$="reorder%" THEN 650
167 IF ZQ$="reorder$" THEN 670
600 REM SORT Routines Jan 84 JGB
602 ' "sort%" -- Sort integer array
    ZS%() by pointers.
603 ' -- Sorted subscripts returned
    in ZV%() vector.
604 ' -- DIM ZS%(), ZV%() the same
    size.
606 ' -- change ZS%() to name of
    actual array.
608 ' -- call w/ ZN% = number of
    elements in ZS%() to sort
610 IF ZN%>0 THEN FOR Z1%=0 TO ZN%-1
    : ZV%(Z1%)=Z1%
    : NEXT 611Z3%=ZN%\2' Z3% = gap
612 FOR Z6%=1 TO 1
    : IF Z3%>0 THEN Z6%=0
    ELSE 617
613 FOR Z1%=Z3% TO ZN%-1
    : FOR Z2%=Z1%-Z3% TO 0 STEP -Z3%
    : Z4%=Z2%+Z3%614IF ZS%(
    ZV%(Z2%))>ZS%(ZV%(Z4%)) THEN Z5%=
    ZV%(Z2%)
    : ZV%(Z2%)=ZV%(Z4%)
    : ZV%(Z4%)=Z5%
615 NEXT
    : NEXT

616 Z3%=Z3%\2' shorten gap 617 NEXT
    618 RETURN 619 '
620 ' "sort$" -- Sort string array
    ZS$() by pointers.
622 ' Sorted subscripts returned in
    ZV%() vector.
```


RESEARCH REPORT

MICROCOMPUTER OPERATING SYSTEM STRATEGIES

- Explores impact on micro hardware and software business of trends in operating systems, including Unix, MS/DOS, CP/M.
- Discusses user perceptions of operating system elements including data management, and the interface between applications software, programming tools and DBMS.
- Details past and future impact of Xerox Dynabook and Smalltalk developments on products such as Apple's Lisa, Quarterdeck's DESQ, Visicorp's VisiOn, etc.
- Establishes the product-planning parameters for future micro product offerings, and reviews probable adherence to these parameters by AT&T's future 32-bit micro, IBM's rumored "4301" and other upcoming products of significance.
- 237 pages; 42 exhibits; published September 1983; price $1,650.00.

For free descriptive literature and a detailed table of contents, contact:

INTERNATIONAL RESOURCE DEVELOPMENT INC.

30 High Street
Norwalk, CT 06851 U.S.A.
Call TOLL-FREE
800-243-5008
(203) 866-6914
WU Telex 64 3452

Circle No. 41 on Reader Service Card

TRS-80™

SAVE SALES TAX* PLUS DISCOUNT
*TEXAS RESIDENTS ADD ONLY 4

MODEL 100 32K

FORT WORTH COMPUTERS

WE ARE SERIOUS ABOUT SAVING YOU MONEY
(Located 30 miles from Fort Worth)
377 Plaza • GRANBURY • NR FORT WORTH, TEXAS 76048

TOLL FREE: 1-800-433-S-A-V-E

Monday thru Friday — 9:00 a.m. to 5:00 p.m.
(Order inquiries/Customer Service &) IN TEXAS: 817-573-4111

Circle No. 42 on Reader Service Card

Circle No. 43 on Reader Service Card

SUSIE SOFTWARE

MICRO–MATH **#MM1** **$15.00**
Converts your computer into a convenient caluculator with 7 programmable memories. Destined to become the most often used program on your portable computer.

MICRO–LABLE **#ML1** **$25.00**
A deluxe list and lable program. Data can be saved to both ram and/or cassette tape files. It allows up to 5 lines of data to be printed onto standard 3½ x ⅞ inch labels and accepts a 6th non-printing data line for LCD display use. The program performs alphabetizing and searches for user assigned printing codes.

MICRO–FILES **#MF1** **$25.00**
A powerful data management program that permits up to 25 files of 12 fields each to be resident in the computer at one time. Each file can consist of up to 900 characters. The program can alphabetize, search on all fields and produce hard copies at the touch of a key.

MICRO–SALES **#MS1** **$25.00**
A point of sales and forms generation program in one! This program will generate personalized purchase orders, sales orders, receipts and invoices. All data can be saved to ram storage. The program is self formatting, eliminating the need for expensive pre-printed business forms, and since it can print consecutive copies, expensive multi-part forms are not needed either. The program even supports sales taxes and discounts and performs all math functions.

MICRO–SALES 2 **#MS2** **$38.00**
This enhanced version of the above program adds additional editing functions and the capability to generate packing slips and statements. It also supports both taxable and non-taxable items on the same form.

MICRO–PILOT **#MP1** **$28.00**
A flight simulator game with multiple airports. Instrumentation consists of an altimeter, air-speed indicator, turn & bank indicator, compass and directional finder, DME, fuel gauge and indicators for flap and landing gear positions. A simple keyboard layout controls throttle, elevator, rudder/aileron, flap and gear controls.

[ ] #MM1 [ ] #ML1 [ ] TRS80 MODEL 100
[ ] #MS1 [ ] #MF1 [ ] NEC 8201-A
[ ] #MS2 [ ] #MP1 [ ] EPSON HX-20

Name _____

Address _____

City _____

State _____ Zip _____

709 Wilshire Dr., Mount Prospect, Illinois 60056 (312) 394-5165


```
624 ' -- DIM ZS$(), ZV%() the same
    size
626 ' -- change ZS$() to name of
    actual array
628 ' -- call w/ ZN% = number of
    elements in ZS$() to sort
630 IF ZN%>0 THEN  FOR Z1%=0 TO ZN%-1
    : ZV%(Z1%)=Z1%
    : NEXT
631 Z3%=ZN%\2' Z3% == gap
632 FOR Z6%=1 TO 1
    : IF Z3%>0 THEN Z6%=0
    ELSE 637
633 FOR Z1%=Z3% TO ZN%-1
    : FOR Z2%=Z1%-Z3% TO 0 STEP -Z3%
    : Z4%=Z2%+Z3%
634 IF ZS$(ZV%(Z2%))>ZS$(ZV%(Z4%))
    THEN Z5%=ZV%(Z2%)
    : ZV%(Z2%)=ZV%(Z4%)
    : ZV%(Z4%)=Z5%
635 NEXT
    : NEXT
636 Z3%=Z3%\2' shorten gap
637 NEXT
638 RETURN
639 '
640 REM  "reorder%" -- reorder
    integer array ZS%() by
    subscripts in ZV%()
642 ' Assumes ZS%() was just sorted
    by the "sort%" routine
644 ' ZV%() is list of sorted
    subscripts to ZS%()
646 ' ZN% == number of elements
    sorted in ZS%()
650 FOR Z0%=1 TO 1
    : FOR Z1%=0 TO ZN%-1
    : IF ZV%(Z1%)>0 THEN IF
    ZV%(Z1%)<>Z1% THEN Z2%=Z1%
    : Z1%=ZN%
    ELSE ZV%(Z1%)=ZV%(Z1%) OR -32768
651 NEXT
    : IF Z1%=ZN% THEN 657
652 Z4%=ZS%(ZV%(Z2%))' get value that
    belongs here at ZS%(Z2%)
653 FOR Z5%=1 TO 1
    : Z3%=ZS%(Z2%)
    : ZS%(Z2%)=Z4%
    : Z4%=Z3%
    : ZV%(Z2%)=ZV%(Z2%) OR -32768
654 FOR Z1%=0 TO ZN%-1
    : IF ZV%(Z1%)=Z2% THEN Z2%=Z1%
    : Z5%=0
    : Z1%=ZN%
655 NEXT
656 NEXT
    : Z0%=0
657 NEXT
658 FOR Z1%=0 TO ZN%-1
    : ZV%(Z1%)=ZV%(Z1%) AND 32767
    : NEXT ' remove flags
659 RETURN
660 REM  "reorder$" - similar to
    "reorder%" - switches string
    pointers
```

```
662 ' Entry: ZS$() array to reorder,
    ZV%() array of sorted subscripts
664 ' ZN% number of active elements
    (0 to ZN%-1) in ZS$()

670 Z0%=0
    : Z1%=0
    : Z2%=0
    : Z4%=0
    : Z4%=0
    : Z5%=0
    : Z6%=0
    : Z7%=0
    : ZN%=ZN%
    : Z4$=" "
    : Z3$=" "' 3 byte holding areas
672 FOR Z0%=1 TO 1
    : FOR Z1%=0 TO ZN%-1
    : IF ZV%(Z1%)>0 THEN IF
    ZV%(Z1%)<>Z1% THEN Z2%=Z1%
    : Z1%=ZN%
    ELSE ZV%(Z1%)=ZV%(Z1%) OR -32768
674 NEXT
    : IF Z1%=ZN% THEN 690
676 Z4%=VARPTR(ZS$(ZV%(Z2%)))-1
    : FOR Z1%=1 TO 3
    : MID$(Z4$,Z1%,1)=CHR$(
    PEEK(Z4%+Z1%))
    : NEXT ' save ptrs to value to
    move "here"
678 FOR Z5%=1 TO 1
    : Z3%=VARPTR(ZS$(Z2%))-1
680 FOR Z1%=1 TO 3
    : MID$(Z3$,Z1%,1)=CHR$(
    PEEK(Z3%+Z1%))
    : POKE Z3%+Z1%,ASC(MID$(Z4$,Z1%,
    1))
    : MID$(Z4$,Z1%,1)=MID$(Z3$,Z1%,1)
    : NEXT
682 ZV%(Z2%)=ZV%(Z2%) OR -32768' mark
    as moved
684 FOR Z1%=0 TO ZN%-1
    : IF ZV%(Z1%)=Z2% THEN Z2%=Z1%
    : Z5%=0
    : Z1%=ZN%
686 NEXT ' find where old Z2% belongs
688 NEXT
    : Z0%=0' continue outer loop
690 NEXT
692 FOR Z1%=0 TO ZN%-1
    : ZV%(Z1%)=ZV%(Z1%) AND 32767
    : NEXT ' remove flags 694 RETURN
699 '
20600 ' Initialization for "sort."
    routines
20605 ' ZS%() is array to sort
20610 DIM ZS%(100),ZV%(100)' 100 ==
    size of sort arrays
20620 Z2%=0
    : Z1%=0
    : Z3%=0
    : Z4%=0
    : Z5%=0
20630 '
60000 ' end
```

Circle No. 44 on Reader Service Card

EASIER COMMUNICATION
with your host computer

Lapcom™ lets you manage memory and view files while connected to your host computer. Copy one file to another, display files, kill files, and execute immediate BASIC commands without disconnecting. Also, convenient function key selection of XOFF, XON and CTRL C character transmission. Download, upload, echo-print and dial. (Does not access the ADRS.DO file.) **$39.95**

Laplog™ lets you store and view the communication dialog between computers. (This is not a download procedure.) Instead, 100's of lines of dialog are stored in unused memory. Scroll through the stored dialog using the arrow keys (like TEXT) while retaining host computer communication. The stored dialog can be printed at any time. Also included is the "snoopy" function. It displays control characters from the host as numeric values in reverse video. This is great for finding communication problems. Program has one-key selection of XON, XOF and CTRL C charactrs, echo-printing, dialing and access in BASIC. (Does not incorporate upload, download or ADRS.DO search.) **$39.95**

Each program on convenient tape cassette, with thorough user's manual ***and well documented source code listing.*** *(Use the listing for programming tips, and for adapting the program to your unique needs.)*

PROGRAMS FOR THE PC-2/1500

PocketCalc™ IV is a spreadsheet program. Capacity with 6K RAM is 140 cells; with 10K RAM is 640 cells. Financial and scientific format. Advanced user interface...4 auto repeat directional keys for scanning cells, instant recall menu and function keys. Prints bar and line graphs. **$29.95**

Developer does cross referencing, renumbering and block deleting of your BASIC program. Very powerful and simple to use. The best programmers' tool available for this computer. **$29.95**

Each program on convenient tape cassette with excellent user's manual.

Money back guarantee if not satisfied.

☐ Send programs as circled above. Check or charge. First class postage included.

☐ Send **FREE** catalog of 40 business and professional programs for the PC-1/1211, PC-2/1500 and Model 100.

My computer is _____

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

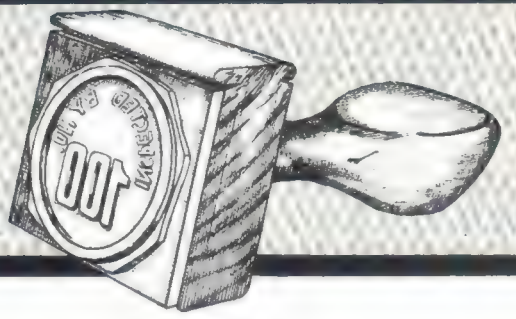
MC/VISA # _____ Exp. Date _____

Signature _____

PocketInfo Corp.

P.O. Box 152 Beaverton, OR 97075 503-649-8145

REVIEWS



SKY RAIDER AND MIND MASTER CHALLENGE, AMUSE

Mind Master and Sky Raider
Alpine Data Systems
P.O. Box 1157
Elizabeth City, NC 27909
CIS EMAIL: 75735,1440
Require 16K system
$14.95 each

By DAVID DUNN THOMAS

Okay space cadets and mind-game experts . . . here are two games for the 100 sure to test both finger dexterity and wit agility.

SKY RAIDER. Belonging to the space family, this first game is a fast-paced shoot 'em down game that picks up speed as it progresses. The object is to shoot down the raiders as they appear, one at a time, before they reach ground and before your spaceship runs out of fuel.

On random occasions the Borons' mothership will appear; your radar siren warns of its approach, and you may accumulate additional points by damaging or destroying it. You start each round with four ships, which explode dramatically as they run out of fuel or are touched by a Boron. Extra fuel is provided for each 3000 points earned. The Borons descend more and more rapidly as your fleet diminishes . . . a very tense situation!

The cute Boron target is formed by three character strings, instead of the five used by John J. Anderson's *Invaders* (*Creative Computing*, August 1983, page 20). Since the Boron flits faster than an Invader, the result is a much tougher target to hit.

P's AND Q's. Two keys proved especially useful: P provides a pause, enabling the player to answer the phone or make coffee without burning up fuel and losing ships. Fuel consumption is controlled by a For-Next loop, not the clock, so pause stops that. P also prints the current time in the lower right hand corner of the screen. By pressing Q, the mission may be aborted. A third key, F, gives the amount of remaining fuel.

MIND MASTER. This is a different type of game and unlike any other I've seen for the Model 100. Eight pairs of items are displayed in random order on a 4-unit-by-4-unit grid. Playing against the clock, rather than for points, the object is to match second choice with first choice, thereby getting the 16 properly paired.

Choices are made by row-column with 1-1 the upper left position and 4-4 the lower right. In the memory-concentration genre of games, it can be quite frustrating as time allowed is decreased with each round and you confuse item locations with those of previous rounds. Take time out for Sky Raider!

TIME WARP. Unlike Sky Raider, Mind Master has little provision for quitting the game prior to completion. Since the continue-leave option is given only if you lose a round and the break key is disabled, you conceivably could be stuck for 27-plus minutes at the game board. For my play, I enabled the escape key to return to the main menu at "Ready?," "1st Choice," and "2nd Choice," preferring that to using the reset button.

When starting Mind Master, be sure you have an accurate time piece on hand because the game-timer resets the clock in the 100 to 00:00 at the beginning of each round.

Upon exiting the game, option 3 allows the player to reset the clock to real time . . . if known! Option 2 allows returning to the system menu without the correct time; why anyone would want to do that is beyond me. Option 1 lets the player return for more mind boggling games.

Mind Master is a different type of game and unlike any other I've seen for the Model 100.

A COMPARISON. The two games have certain factors in common. They come one-to-a-cassette and are recorded only once on each side, though there's room for two per side. I had no problems loading either one with a Radio Shack CCR-81 tape recorder.

Sound effects for both are very well done, with appropriate tones belting out success and failure. The radar warning siren in Sky Raiders is a particular favorite of mine.

Alpine has a Hall of Fame scoreboard set up that greets players and ushers them out. It records the initials and scores of up to eight players with the low scores being dropped. Unfortuantely, it doesn't update scores. (Your reviewer could have had eight different scores recorded in either game!)

Documentation for Sky Raider is very good. The instructions are clear and scroll neatly across the screen from left to right. Mind Master, on the other hand, has no instructions in the program, and it needs them. The printed instructions for both are ade-

TRANSFORMS YOUR MODEL 100 INTO A COMPLETE BUSINESS ANALYST TOOL

TENKY +

Performs strategic "what-ifs" at the touch of a function key

- Does complete compilation with text-notations of any aspect of your business finances.
- Generates breakeven analysis reports, showing sales volume and selling price studies in relation to business costs.
- Prints fully formated amortization schedules also gives instant on-screen loan, term, interest or payment information.

- Does detailed printout of costs of goods, fixed costs, sales, or breakdown of any variable on your financial statement.
- Solve for any of over 12 variables in financial formulas — with a single function key.

  Does IRR/MIRR, NPV, compound interest, annuities calculations.
- Does logs, powers, recipocals.
- Use TENKY + for all calculations, from the simplest to the most complex.

TENKY + $59.95

INCLUDES CASSETTE, STEP-BY-STEP INSTRUCTION MANUAL.

MC/VISA/C.O.D.

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

PCSG provides hotline software support for the Model 100. Call us at 214-351-0564

Circle No. 45 on Reader Service Card

WORLD'S SMALLEST 40-COLUMN IMPACT PRINTER

FITS IN A BRIEFCASE WITH YOUR COMPUTER!

MEASURES 4" x 4½" x 2¼"

Model 2601

KEY FEATURES

Uses Plain 2¾ inch paper, so refills are inexpensive, easy to find, and won't fade
* UPPER & lower case characters
* Selectable Column Width - 24,32, or 40
This is 40 column print
This is 32 column print
This is 24 column print
* Double width print
* Double height print
* ENLARGED Print
Bit-Mapped Graphics

RADIO SHACK MODEL 100 GRAPHIC CHARACTERS

* Works on 9-12 Volts DC
* Uses a dot matrix mechanism by EPSON known for performance and reliability throughout the world.
* Character matrix 6X8
* Uses readily available replaceable ribbon cartridge
* User loadable 6X8 character in RAM
* Centronics parallel interface
* Self test mode

Now you can print wherever you go!
Don't be fooled by its size. The 2601 was designed to be portable—not primitive.
In fact, Money Magazine's "1984 Money Guide to Personal Computers" recommends the 2601 for use with the Model 100 as a portable word processing system. Here's why:

PRICE: $139.95
Includes roll of paper, ribbon cartridge, AC adaptor, and shipping.

ACCESSORIES: Standard Cable $14.95
Cigarette Lighter Adaptor ..... $ 9.95

Ask about Model 4601 which has built-in rechargeable Nicad batteries. $199.95 And Model 2604 which connects directly to Radio Shack's Color Computer. $129.95

CALL AND ORDER TODAY!
(305) 594-1000

FIDELITY COMPUTER PRODUCTS
8800 N.W. 36th STREET, MIAMI, FLORIDA 33178

OEM and Dealer inquiries invited.

Circle No. 46 on Reader Service Card

quate but are in itty-bitty print: 17 characters per inch.

PROGRAMMING NOTES. Both games struck me as peculiar in that graphic characters in quotes are used throughout instead of CHR$(nnn). In Mind Games the lines for insertion of an escape are 310, 360 and 420; the fix should be a GOTO4600 rather than menu so the clock may be reset to real time.

Also, for some odd reason, both games set MAXFILES=0 on exit to menu which can cause considerable frustration to the novice. Sky Raider is 7538 bytes, CLEAR400 to run it; Mind Master is 8635 bytes, CLEAR350 to run it.

Over all, both games are quite enjoyable in totally different ways. ◀

PORTATAX MAKES FACT OF LIFE EASIER TO LIVE WITH

PortaTax
Skyline Marketing Corp.
4510 W. Irving Park Rd.
Chicago, IL 60641
312-286-0762
Written in Basic by Alfred M. Lizza and Steven N. Ross, CPA
Minimum of 24K required, 32K preferred
$99.95 plus shipping and handling

By MARY JEANN BATHAM

Here's a solution for one of life's inevitables: taxes. This new program calculates the amount of federal income tax owed for the year and closely follows the 1040 personal tax return. Meant for personal use, rather than for corporate filing, Skyline's software qualifies the product in the manual as a planning tool only and not a substitute for expert tax advice.

I was impressed with the professionally prepared manual. I'm the impatient type of software user who loads the program, runs it, and later reads the manual when the program won't work, but because Skyline placed the program's installation instructions at the end of the manual, I was subconsciously forced to read the first 14 pages of documentation before loading the program and playing with it.

BAD NEWS FIRST. There were three problems with the software:

- Difficulty loading from tape;
- Amount of memory needed to load; and
- Inability to use commas when entering numbers in the thousands.

I had great difficulty loading PortaTax from the tape recorder to the 100. As suggested in the manual, I tried using the Realistic Minisette-9 recorder at different volume settings.

I finally went to Radio Shack to try one of their CCR-81 tape recorders. We retried using function key 2, typed CAS:PTAX32 and the program successfully loaded.

32K NOT ENOUGH. The manual tells you to leave 17K for loading the program and another 5K for memory. An upgrade to 32K is suggested for those with a 24K machine. My 100 has 32K, but I still had to kill most of my Basic programs, and take a lot of old boyfriends out of ADRS.DO to allow enough memory for loading.

One other difficulty with the 32K version: I couldn't save the Basic program in ASCII and dump to the disk of my Tandy-2000. If the file had been 14 or 15K, I'd have had enough memory to save it both as a .DO file and as the .BA version.

I was delighted the program allowed income levels as high as $9,999,999.

FORGET COMMAS. Most people are used to writing numbers in the thousands as 25,000. However, when using the income section of PortaTax, only the numbers to the left of the comma are picked up by the program, so 30,000 is shown as 30. No "extra ignored" warning message shows on the screen. You won't realize the miscalculation until you've finished the rest of the income section.

The manual on page 5 shows numbers written 9,999 so one would assume commas are acceptable. If commas are used, and the calculations are incorrect then one has to hit F7 for "new" and start over, or hit <shift> <break> RUN to reload the program.

There are two ways to fix this most annoying bug in the program: Reprint the manual, taking the commas out of the examples on page 5, and advising the user to enter numerical values without a comma, or write a short subroutine which searches the string for commas.

FILING STATUS. The first step in computing income tax is to indicate the tax filing status (lines 1 to 5 in the 1040 tax return). The manual clearly indicated husband is used to indicate the sole taxpayer, whether or not he's single, widowed, or female.

The next prompt reads "enter number of exemptions husband or joint." This may be confusing unless you carefully read page 4 of the manual. One tends to enter 2 for the husband, anticipating the program will prompt with another question about wife's number of exemptions. It doesn't, so if you didn't list wife's exemptions under the husband prompt, you lose your chance to count them unless you restart the program. This is inconsistent with the rest of the program which asks for husband's and wife's income/deductions/adjustments separately.

INCOME ENTRY. I was delighted the program allowed income levels as high as $9,999,999.00 — though, anyone earning nearly $10 million annually would probably have a full time CPA and tax attorney.

The income entry procedure was a bit confusing. The program had a resident zero appearing at screen position 200. Perhaps this was a clue on the part of the software authors that the entry would default to zero if enter were hit, although the manual failed to point out this feature. Amusing was the authors' inclusion of: How much alimony does husband earn each year?

ADJUSTING ENTRIES. The program prompts follow tax return 1040, lines 23 to 31, with the exception of line 26

—TARGET-WRITER—

Manuscripts, Reports, Proposals, Newsletters, Personalized Letters

- Columns with decimal alignment
- UP TO 5 FOOTNOTES[1] PER PAGE typed "in-line" where referenced and automatically moved to the bottom of the page.
- PARAGRAPH TEXT ALIGNMENT under paragraph headings (I., B., 1., a., etc.) and under "bullet" characters of your choice. Paragraphs may be ANY length.
- MAILER feature for customized personal letters with up to 9 inserts while maintaining even margins. Letters for TARGETED names or for an entire list. Plus:
  - SURNAME RECOGNITION
  - MULTIPLE OVERLAPPED ADDRESS LISTS
  - ENVELOPE & LABELS
  - ATTENTION LINE

CENTERING

OR LEFT

RIGHT JUSTIFIED,
and RIGHT ON THE *same* line!

- CHARACTER STYLES (superscript, subscript, underline, compressed, italic, expanded... or whatever your printer will produce) pre-defined to single character controls for on/off operation.

MIXED CHARACTER *STYLES* ON THE SAME LINE while maintaining even margins!

- JUSTIFIED MARGINS
- SINGLE-CHARACTER CONTROLS
- PAGE BREAKS, SIZE AND LENGTH
- DRAFT or FINAL QUALITY
- MULTIPLE COPIES
- Pass-through control for special printer codes
- INCLUDING OTHER FILES
- TAB WIDTH AND MARGIN CONTROL
- HEADING AND PAGE NUMBERING
- CONTINUOUS or LETTERHEAD
- CR/LF option

Program size 8k; in BASIC. Price $69.95; California residents add 6% or 6.5% sales tax as applicable. Price includes cassette, 12 page user guide and shipping. Specify printer type and model when ordering. For other than EPSON, GEMINI, RADIO SHACK printers, enclose copy of control code summary with 5 character styles preferred. To order, send check or money order to:

TARGET SYSTEMS
BOX 507, PACIFIC GROVE, CA 93950
408-646-1547

[1] May be superscript, numbers, letters, or symbols.

Circle No. 47 on Reader Service Card

which is covered with function key F4.

Commas in this section threw off the calculations too. The program allowed me to shelter $100,000 in an IRA, but the manual explained on page 7 this isn't a bug in the program, but merely the use of the same line for IRA's as well as other pension plans.

KEOGH PLAN CONTRIBUTIONS. The program for this function is excellent. If I'd input a business or partnership income amount, the program stopped me by aborting back to the main menu; preventing me from setting up too many pension plans that the IRS won't allow.

DEDUCTIONS. This part of the program followed Schedule A of the 1040 form, lines 1 to 28. Again one must watch out for commas. Also if you hit a zero for a total in any category, the program will clear all detail previously entered. However, enter will still default to zero, and won't mess up the previous amounts you input.

CALCULATION. After getting through the first five function keys, you're prepared to learn how much the IRS "taketh away." I liked the feature that checks if salary subject to social security (FICA) tax doesn't exceed the limitation of self-employment tax. Other excellent points are the calculation of alternate minimum tax-using estate tax, qualified investment interest, trust accumulations, and tax preferences. These items, however, are more likely to be used by individuals in upper income brackets rather than by the average person calculating his tax liability on the 100.

PortaTax also allows computation of income averaging to see if that would save you money.

The program also contains taxes owed for investment tax credit recapture, social security from unreported tips, tax on IRA's, as well as credits for senior citizens, political contributions, child or dependent care, jobs credit, or home energy credit.

There are three options in the 32K package for output to the printer:

- <y> prints the listing of all data to the printer;
- <n> returns control to the bottom of the screen and highlights the function keys; and
- <f> creates a RAM file by customer name for later viewing or printing.

Function key 7, clears out the data and starts over. When you've entered commas by mistake (or zeros in F5), you use F7 a lot!

Function key 8 ends the program.

POTPOURRI. The program has a built-in error detection feature if you accidentally enter an alpha instead of numeric character. It repeats the last prompt until you enter numbers instead of letters.

The main difference between the 32K and the 24K version is the 32K allows you to create a RAM file to hold the data and output to the printer later. You can create several RAM files, by customer name, depending on your remaining memory. The 24K version allows only the option of print or no-print now.

An appreciated feature is when hardcopy is printed, the date and time of printing are displayed.

PortaTax is probably best suited to those earning $30,000 or less or for taxpayers without itemized deductions who use the 1040 EZ form. Someone in a higher income bracket should consult a CPA to get the best possible tax advice.

It might not promise you a tax refund, but PortaTax is an impressive program. ◀

MODEL 100 AS MANAGER OF SOCIAL AND BUSINESS LIFE

THE TRAVELING APPOINTMENT MANAGER
Version 2.1
Traveling Software, Inc.
11050 Fifth Avenue, NE
Seattle, WA 98125
206-367-8090
Minimum of 16K required
$59.95

By MARY JEANN BATHAM

You don't have to be a traveling executive out of town four days a week to use this program. Traveling Appointment Manager is a program for the business person who wants to keep track of business and social engagements by computer.

The software is compatible with the TRS-80 Model 100, Olivetti M-10, and the NEC PC-8201 computers. Along with the appointment program are three others: Things to Do Manager, Appointment Manager Report (for

PORTABLE COMPUTER DESK TOP STAND
THE POCO STAND
$17.95
by DISKUS™
Improves Viewing and Typing Angle
Briefcase Portable
Mail Check or Money Order to: DISKUS PRODUCTS 6003 Bandini Blvd., Los Angeles, CA 90040. VISA or M/C call (213) 726-3088 *The POCO STAND* $17.95 plus $2.00 each unit Shipping & Handling — CA residents add 6.5% sales tax.
Patent Pending. © 1983 DISKUS PRODUCTS For RUSH Delivery add $2.00 extra — U.P.S. Blue Label
Circle No. 48 on Reader Service Card

output to a printer), and a memory manager program that calculates the length of files saved in RAM.

The program lists daily appointments, reoccurring activities, or even mundane tasks such as taking out the garbage.

INNOVATIVE AND FUN. The author of the manual has a great sense of humor, and makes using the programs lots of fun.

The manual is written for the first-time computer owner who has just taken his 100 out of the box. Complete instructions, with photos, are given on how to hook up the tape recorder cables to the machine, and how to load the program into memory.

Traveling Software has one of the most innovative ideas I've ever seen. On the flip side of the cassette is an audio tutorial by the "Traveling Professor." The manual suggests listening to the voice tape first, and then going on to the written instructions. The professor, with his British accent, gives good advice for using the program. Sir Lawrence Olivier he's not, but the violin music in the background gives you the idea this is a program with class.

For those of us expert computer users who don't want to read everything in the manual before playing with the program, there's an excellent feature. Short paragraphs written on a gray background summarize the terms and concepts of the program. You can skim the gray areas in a few minutes, skip the exercises written on the white background, and still use the program to full capacity in a very short time.

EASY START. Section one of the manual explains the differences between the Radio Shack, NEC, and Olivetti portables. The arrow, enter, and function keys are clarified, and instructions on how to load the tape are shown.

Section two of the manual explains how to use the program. The first-time user is told how to set the dates and time on the computer, and screen illustrations are printed every couple of pages to simplify its use.

When APPMGR is accessed, a calendar of this month is drawn on the screen and the blinking cursor is positioned over today's date. Enter defaults to today. If you prefer to check out another day, just type over the date and it appears. Using the arrow keys, you can change the month and year, as well as the date.

The program automatically adds the colon when inputting hours and minutes. This is a time saving feature, since you don't have to leave the numeric keyrow, searching for the shift-colon keys. Also if you want an appointment shown for 10 o'clock, just type in 10, and the program adds the two zeros for minutes.

The program is written in the twelve-hour clock, so A for a.m or P for p.m. must be added. Thirty minutes is the default, but you can enter minutes in three digits, such as 130 for an hour-and-half appointment.

NO DOUBLE BOOKING. If you schedule two overlapping appointments, the computer will accept them, but will beep and warn you on the bottom of the screen that you have two activities set for the same time. This is an excellent feature.

FINALLY!

MODEL 100™ ROM

Easy Installation In Optional ROM Socket
Needs No Optional RAM
No Tapes

• Renumber BASIC Programs
Instantaneously renumbers all or part using any step value
REM statements are not renumbered, allowing preservation of subroutine line numbers

• Assembler
EASY!
Full 8085 instruction set
ORG/EQU/DS/DB/DW pseudo ops
Expression evaluation

• Debugger/Simulator/Disassembler
Establish the validity of your assembly programs
Set breakpoints, inspect or change RAM, execute assembly commands interactively, list disassembly of memory, trace execution and almost everything else!
Complete 8085 status shown!

• Copy .DO Files
Copy .DO files from BASIC without using the 100's paste buffer

• Compare .DO Files
Determine if two .DO files are exactly alike, quickly!

• Files
Our FILES command gives a complete list with file sizes in bytes
No more wondering where your precious space went!

• Additional ROM Routines
Convert strings to or from mixed expressions of decimal, hex, binary, octal and ascii
Open/Edit/Insert/Delete .DO file by name
Insert/Delete bytes in BASIC programs

COMPLETE PACKAGE IN ROM ONLY $79.95

SEND CHECK OR MONEY ORDER TO:

PLEASE ADD $3.00 FOR SHIPPING AND HANDLING

POLAR ENGINEERING AND CONSULTING, 3013 Cottonwood St., Anchorage, Alaska 99508

Circle No. 49 on Reader Service Card

The next prompt is for the name of the appointment. It must be 10 characters or less. If you use less than 10 letters, hit enter to jump to the next field. You now have the option of rescheduling the appointment for the same time tomorrow or scheduling it for only today.

When you turn on the computer the next day, a message will remind you of this reoccurring appointment which appears with asterisks next to it instead of the designated time. This reschedule will keep coming up until you set another time or delete the entry.

The cursor jumps to the last data field, "comments". Up to 58 characters can be input in the comment field, which is an excellent length. Editing your typing errors is easy using the backspace key.

SOCIAL SECRETARY. When the entry is saved to RAM, another screen appears showing the appointment time and name, and seven function keys are highlighted:

- F1 ADD allows more appointments to be shown for today;
- F2 DEL deletes any entry; when you choose delete, two more function keys allow you to decide which appointment to delete;
- F3 UPD is an edit feature allowing the user to go back and change data in an appointment previously entered;
- F4 PREV returns to the previous appointment set;
- F5 NEXT allows you to skip killing this data and go to the next appointment;
- F6 VIEW shows the complete listing of the appointment, with duration time and comments; if you had set up appointments to be rescheduled, you're also prompted with a function key and asked to set a time or delete this appointment reminder; and
- F8 END returns you to the calendar menu.

MEMORY SIZE. After appointments have been set, a number appears in the upper right hand corner of the screen, showing how many appointments have been set. The manual points out a hundred appointments use 3K to 8K of memory, depending on how much data is entered in the comment field. This is a good reminder if you have only a 16K machine, since you'll run out of memory quickly using the full length of the comments field.

If this is a problem, there's another excellent feature of Appointment Manager called "record retention setting." The program defaults to a seven-day schedule, and automatically erases any appointments older than a week. If your machine has lots of memory free, you may want to change the default to a month's retention setting.

JOB LIST. Section two explains the program's Things to Do Manager. Load TTDMGR from RAM and you can list your appointment priorities for the upcoming week.

The program gives you three choices: run the program, print a list of things to do, or set a record retention period.

Option one shows a calendar similar to the appointment manager screen. A date can be selected; pressing enter defaults to today's date. After the date is selected, the screen shows "nothing

YOUR WELL NEED NEVER RUN DRY

PRAIRIE POWER™...Freedom at last for the Radio Shack Model 100 and other six-volt briefcase portables. Prairie Power is a carefree battery system that eliminates the need for AC outlets or the expensive use of "AA" batteries. This rechargeable system can be used anywhere, in any position. Check the ratings below to see how PRAIRIE POWER compares as a real value. Our system can give up to 160 hours between charges...that's over a month (8 amphere-hour unit) if you use the Model 100 four hours a day. Our light-weight, palm-sized systems will easily fit into your attache or computer case and come with a 5' cable for the Model 100. One year warranty. (Charger extra.)

PRAIRIE POWER COMPARISONS

"AA" Duration on MODEL 100	19 - 20 Hrs.
PRAIRIE POWER (8 Amp. Hr. Unit)	140 - 160 Hrs.
(5.5 Amp. Hr. Unit)	90 - 100 Hrs
(2.6 Amp. Hr. Unit)	45 - 55 Hrs

Cost for "AA's" at 3 Hrs. Usage/Day can cost $188/Yr

BLUESTEM PRODUCTIONS, Box 334, Wayzata, MN 55391 • (612) 471-7795

Please send me:

_____ 8 Amp. Hr. ($34.95) _____ 5.5 Amp Hr. ($29.95) _____ 2.6 Amp. Hr ($21.95)

_____ Universal 220/110 charger ($10.95) **Add $3 to total for freight.**

TERMS: Check, Money Order, Visa/MC. U.S. Funds only. MINN. add 6%

Name _____ Phone _____

Address _____

City _____ State _____ Zip _____

_____VISA _____M/C Card # _____ Exp. Date _____

Signature _____

Circle No. 50 on Reader Service Card

Circle No. 51 on Reader Service Card

Avion Communications

Your Notebook Computer Software Source

PORTABLE COMPUTER SUPPORT GROUP

Business Pak +	$76.50
Data +	51.00
Sort 2 +	28.00
Tutor +	28.00
Tenky +	51.00
Disk +	59.50

AMERICAN MICRO PRODUCTS

American Calc Spreadsheet	$55.00
RPN Calculator	25.00
Equation Solver	34.00

TRAVELING SOFTWARE

Time Manager	$51.00
Appointment Manager	51.00
Sales Manager	51.00
Expense Manager	51.00
Traveling Writer	42.50

SKYLINE MARKETING

Porta Calc (Incl. Porta Dex & Porta Print)	$59.50
Porta Stat	38.00

MasterCard VISA

Personal checks welcome.
Please add $2.50 for shipping.
NYC residents add 8.25% sales tax.

Call toll free
1-800-235-2115
In New York call (212) 532-6660
Avion Communications, Inc.
Suite 2405
200 Madison Ave.
New York, N.Y. 10016

to do for today," until you enter appointments. The cursor blinks in the first field, PRTY (priority), until you assign a value. You can choose a number, or an alpha character, like A to Z. The program will list numbers first, then letters.

After the priority is assigned, the cursor jumps to the reschedule field, and you can reschedule the appointment (Y) or not (N). The cursor then moves to a task description field and you can type up to 29 characters. When finished typing, hit enter and press F1 SAVE to add other entries.

The menu gives a choice of DEL (F2) to delete an appointment or COMP (F3) for a completed task. When a chore or appointment is finished, you may want to keep the item on the list for future reference (such as a birthday or anniversary). The letter C appears in the reschedule column after you've chosen the option F3, and the appointment is saved forever.

This program is a great feature of the software package, and is a good reminder for those menial tasks we tend to put off.

PRINT OPTIONS. Section three of the manual explains how to output the appointment data to a printer. If memory is a problem, the manual suggests killing the APPMGR.BA file and loading AM-RPT.

The screen asks for beginning date (today's date is the default). Ending date is prompted and can be entered without leaving the numeric row since no slashes are needed in the date field. The program then asks if you need a line feed or carriage return for your type of printer. The program defaults to "no line feed."

You also have the option of choosing a 40-, 80-, or 132-column printer. The default is for an 80-column printer, but you may want to put the dot-matrix printer in the office into condensed type and print a 132-column display of your appointment schedule to carry in your pocket or purse.

Section four of the manual explains how to use the program Memory Manager. The screen shows file title, (in)visible, and length of bytes for each file. F1 takes a visible file and makes it invisible, even though it is still located in RAM. If others use your 100, you may want to hide files using this method. To recover an invisible file, go into basic and load it from RAM. Run the MEMMGR program, press F1 and behold, the file is now visible again.

ERROR FILTER. Section five of the manual explains about troubleshooting with the program. Explanations are given on loading problems and advises what to do if the program locks up.

The error messages SN, OM, UL, TM, and FF were covered, with excellent descriptions of what to do when an error message is generated. The section also advises about possible conflicts with other software in memory at the same time as Appointment Manager.

Traveling Software developed a proprietary technique which creates machine-language subroutines from a Basic program during program execution. No separate machine-language program (.CO) needs to be loaded when using their software. This is wonderful since only one machine-language program at a time can occupy a particular RAM memory location.

ORGANIZED AT LAST. I was very pleased with the four programs in the Appointment Manager software package. The program and manual were user friendly, even for the first-timer. The addition of the memory manager program was an extra bonus in the package. This software package is an excellent value and will certainly make my social and professional planning a lot easier. ◀

CHATTANOOGA TAX PACKAGE WORTH THE MONEY

Book
Chattanooga Systems Associates
P.O. Box 22261
Chattanooga, TN 37422
Minimum of 4K RAM required
$29.50 plus shipping and handling

By MARY JEANN BATHAM

Just in time for last-minute tax preparers, here's a small business and professional income tax bookkeeping system written for the Model 100.

Book can prepare monthly profit

and loss statements for corporations as well as personal tax returns. The program uses a single-entry system, so is easy for users who don't know a debit from a credit.

PIRATES! Realizing there are unsavory-types lurking "out there," Chattanooga Systems Associates has an innovative licensing system. Once you've purchased the software, you can sublicense your friends for a fee of $10. The fees are sent to CSA, along with your friends' names and addresses, so they'll receive updated information on the product. Additional copies of the 12-page manual are available for $5.

The manual *looks* like a pirated copy, but it's well-written and user friendly.

I had trouble loading the program from tape, but adjusted the volume settings and finally got it to work. Page 12 of Book's manual had a notice about difficulty in installation; it suggested using a tiny screwdriver to adjust the head alignment when using the CCR-81 recorder. Without adjustment, I got syntax errors. This information would have been a lot more useful if it'd been inserted on page four with the installation instructions.

EXCELLENCE. The instructions are superlative for shortening the length of the program from 4K to 3K by deleting 12 of the program lines. They also offer another way to cut program length in the appendix. Clearcut step-by-step details are given on how to make a backup of the program on tape.

I tried to run the program without finishing the instructions, though, and received an FF ERROR in 36. I looked at the line, which opens a file named SBK.DO, and thought I might be out of memory, so killed a few files. The program actually runs by typing GOTO 20 after the error message is displayed.

Once running, Book prompted me for a title which would be output to the printer. Being an accountant, I mildly objected to the use of the word title . . . I'd have preferred "customer name" as a prompt.

The next prompt asks for dollars per mile for car mileage. Most of us are accustomed to the term "cents per mile," but the dollar sign saved an error since one would place the decimal point before the mileage allowance: i.e. .225 "dollars per mile."

PROGRAM OPERATION. The first screen display shows the title (customer name) installed, date, and three options: add records; output; and exit.

If you choose to add a record, the next four choices are: receipts; cost of goods; deductions; and expenses. This terminology is all right when using the program to prepare a 1040 tax return, but I found the listing confusing while preparing a profit and loss statement.

"Deductions" actually are the expenses for the company and "expenses" refer to a travel expense account. Perhaps option three could have been renamed expenses and option four renamed travel.

There's a good feature that scrolls to the next account name when enter is pressed.

When an account name is selected, the screen clears and the date prompt appears. If the posting date is the same as the date you're making the entry, press enter.

When one does a lot of posting using the current date, this prompt gets to be tedious. It might have been simpler for the author to write a short subroutine to set the date at the beginning of operation, saving a step every time an account is posted.

CALCULATING. The next prompt is "describe." Up to 40 characters of description can be entered.

The data prompt offers three options: leave the field blank; input check numbers; or show simple calculations.

Only nine characters can be typed, but the manual doesn't mention this limitation. I realized this when I output to the printer and the numbers tabbed too far to the right. This made the printout messy.

The data has a nifty built-in calculation feature. If I sold 10 units at $395 each, I would input 10@395 and the program would automatically figure the total sales to be 3950.

When the car mileage account is reached, enter your milage and when the amount prompt appears, hit enter. The mileage automatically is calculated, a time-saving feature.

After each account is posted, a short menu appears with three options: more, redo, or next. This is excellent, since you may want to show several entries under the same account, correct typing errors, or go on to the next account.

Circle No. 52 on Reader Service Card

CHATTANOOGA CHOO CHOO SOFTWARE
Your One Stop Station Track 29
For Computer Programs

BUSINESS

"FREE Prop Legs with each order."

* Skyline Software
PortaTax - tax planning program
(32K) ~~$99.95~~ $94.95

PortaCalc - Electronic spreadsheet
PortaPrint & PortaDex included
(24K) cassette ~~$69.95~~ $66.45

*PortaStat - statistical package
*PortaMax - linear programming
*PortaFin - loan & investment pkg.
*PortaFolio
(24K) ~~$44.95~~ $39.95 ea.

* Portable Computer Support Group
Business Pak+ includes:
Write+, Graph+, Expns+, Telex+,
Put+, Sort+, & a 120-page manual
6 cassettes (8K) ~~$119.95~~ $85.45

Data+, Tenky+ (8K)
~~$59.95~~ $56.95 ea.
Sort+, Tutor+ (8K)
~~$29.95~~ $28.45 ea.

* Chattanooga Systems Associates
Book-Bookeeping,
Tfile-Tape File Management,
Check-Checking Account Record,
Index-List Processor,
Calc-General Purpose Calculations
(8K) ~~$29.50~~ $28.00 ea.

Scribe-Word Processor
Formats & prints from text files.
(8K) ~~$29.50~~ $28.00

Expanded Scribe (version 3.1),
Plus version 3.0
~~$39.50~~ $37.50

8K RAM MODULES
~~$64.95~~ $59.95 ea.

NEC PC8201A
w/AC Adapter $750.00

Prop Legs
$3.50 pr. S & H included

Silverware
Games 1 - 4 games on cassette
Blockade, Frankenstein Adventure
Reversi, Alexis Adventure
(24K) ~~$24.95~~ $23.70

Games 2 - 4 games on cassette
Maximum, Checkers
Amazing Chase
Williamsburg Adventure
(24K) ~~$23.95~~ $23.70

Prickly-Pear Software 10% OFF
Viking - (24K) simulation game
~~$19.95~~ $17.95
Football Quarterback Strategy
(16K) ~~$19.95~~ $17.95

*NEC & M100

Personal checks and
PURCHASE ORDERS WELCOME.
Please add $2.00 for shipping
in the U.S.A.
Tennessee residents
add 6.25% sales tax.
C.O.D. orders add $2.00.
Send for FREE catalog!

(615) 875-8656
P.O. Box 15892
Chattanooga, TN 37415

BE AWARE. There are two problems that could have been avoided by a couple of paragraphs in the manual: getting the program to enter the account field and typing commas in a number like 10,000.

When an account classification is selected, the chart of accounts begins to appear. Pressing enter moves you to the next account. I played with the program for quite a while, wondering how to access an individual account so I could post.

Finally I hit Y and the program allowed me to proceed with my posting. There's nothing in the manual to tell you how to get into an account. Perhaps it assumes you would hit Y for yes, but a first-timer might be confused, as I was, trying to figure out how to reach the account field.

A user who isn't familiar with computerized accounting will input a number like 10,000 with a comma. This generates an "extra ignored" error message. You have the option of redoing the posting; however, the manual should caution you not to use commas when typing numbers.

If you're entering a lot of numbers in even dollar amounts, you can type 345 and the program automatically will add the two zeros to the right of the decimal point. This is a great time-saver when you are doing extensive posting.

CHART OF ACCOUNTS. A chart of accounts is listed on pages two and three of the manual. The program is set up for a manufacturing or retail sales type of business, rather than for a service business like a doctor, accountant, or travel agency. Service businesses don't have beginning or ending inventories, but one can skip the inventory calculations and enter the cost of operations in account 2.0.

The expense accounts (mislabeled deductions) show depletion as account 13 and windfall proft tax withheld as account 30. These are very specialized account titles, used mostly by gas and oil exploration companies.Since most 100 users don't own *too* many oil wells, these accounts are useless. A service business wouldn't use the account titles freight nor laundry either.

One important account ignored by the program is telephone. But perhaps they lumped phone under the category of utilities.

Account 21 is labeled Office Supplies and Postage, yet account 25 is labeled Supplies. Where do I post the supplies, under 21 or under 25? I would call 21 postage and 25 supplies to avoid confusion.

BREAK IN. Fortunately, it's easy to get into the program and change the account titles in data lines 14 to 17.

The program starts with line 1 and every line number is used in consecutive order to line 53. It's a bit more difficult to change a program where there aren't free numbers between lines, but it can be accomplished by adding statements to existing line numbers. The author might have written the listing this way to discourage program modification.

Since Book is written as a single entry system, no balance sheet is produced. Most small business owners don't care about balance sheet figures and only are concerned with the bot-

Get more use from your Model 100
Let the Elves help!

ELF-WRITER
Expand your text processor! Features include: — Formatted veiwing mode with horizontal scrolling — Formatting uses Wordstar™ dot commands: Variable margins; Pagination; Headings & Footings; Right justification of text; And Much More!!

ELF-COP
Manage your file space problems! Backup all of your files at one time. A backup report documents your backup. ELF-COP will also Copy, Rename, Delete and Report file sizes.

TM - MicroPro International Corp

ELF-PAK = ELF 1 + 1 CALCULATOR + ELF-BANKER
ELF 1 + 1 turns your computer into an easy to use calculator. Features: Entry, Total & Memory displays; %, Exponent & Square Root keys; + More!

ELF-BANKER evaluates your money for the most return. 20 calculations including: Compound interest, Present value, Loan & Mortgage payments, Annuities & Active Savings accounts.

$39.99 EACH
•SPECIAL OFFER•
All 3 for $90.00
Price includes shipping.

Send the coupon below to:
Ceres Software Inc.
4303 S.W. Chesapeake Ave.
Portland, OR 97201
(503) 245-9011

Please send me on cassette:
☐ ELF-WRITER ☐ ELF-COP
☐ ELF-PAK
☐ Special Offer $90.00
☐ Check for _____ enclosed
☐ Send C.O.D.

NAME: _____
STREET: _____
CITY: _____ STATE: _____ ZIP: _____
TELEPHONE: _____

Circle No. 53 on Reader Service Card

tom line on the profit and loss statements. Only an accountant would notice the lack of a balance sheet, but it's easy to construct one: use the numbers crunched out by the profit and loss statement.

OUTPUT. The manual reminds you to make certain the printer is connected before making a hard copy of the program. After selecting output from the main menu, a sub-menu appears with: summary, detail, or purge.

Summary prints a professionally-spaced 80-column hard copy of the profit and loss statement. If you have a lot of accounts, the program recognizes end-of-the page and spaces to print on the second page at the top of the paper. I like the way the profit and loss statement is set up.

The summary part of the printout lists the receipts, cost of goods, gross income, total deductions, and net profit. Then the details of the expenses is shown by account names. The cost of goods is shown by category detail. Travel and entertainment expenses are summarized.

This is a nice way to present a profit and loss statement to the non-accountant business owner, who may, or may not, be interested in the line-by-line details of the accounts.

The detail printout is really neat. It's set up for 80-column format and is arranged by account and posting date. Older entries are shown before newer entries.

Each account name is: separated by a line of asterisks; shows full description; summarizes data; and lines up amounts with commas appearing to separate numbers in the thousands. This detailed printout is excellent for a manager who wants to check account postings.

Instructions are given on how to dump the listing to a tape recorder in order to save memory on the 100. After the accounting numbers for the period are saved to tape, you can purge them.

FILE MANAGEMENT. Pages 9 through 11 of the manual give clear instructions on the layout of the program's files. Instructions for taping data and for transmitting files using TELCOM are well-written. You can prepare the profit and loss statement on your 100 and transfer it by CompuServe or MCI mail to a remote office, or do a direct computer-to-computer transfer to the 100 to your Tandy 2000 or IBM PC at the office. The ability to transfer to another computer allows you to save the information to disk, which is preferable to saving on tape.

GOOD INVESTMENT. I was very impressed with the program. I have a professional general ledger program for my Model III and am still waiting for the perennial accounting software just around the corner for my Tandy 2000. Book is so versatile I loaded it into the Tandy 2000, changed a few lines so the data would output to my disk drive, and am using it on my expensive business computer.

The $29.50 price may lead you to believe Book is not a professional software package, but don't let that fool you. Invest the money and you'll have a program that works extremely well. ◀

READER SERVICE

Obtain more information concerning products advertised in this month's issue of **PORTABLE 100** — it's simple and free!

- Answer questions A through H on the card opposite.
- Circle the number(s) corresponding to advertisements for which you would like more information.
- Either (a) print or type your name and complete address on the attached card and mail; or (b) telephone TOLL FREE

1-800-225-5800

and give the operator your name and address. The operator will then ask you several of the questions (A through H) and which issue you are referring to (i.e., Issue 8401 - January 1984), as well as in which Reader Service numbers you are interested.

- The literature you have requested will be mailed to you free of charge directly from the manufacturer.
- Please bear in mind that sending information represents a major expenditure on behalf of the advertisers. PLEASE BE SELECTIVE IN YOUR CHOICE!
- Allow 3 to 5 weeks delivery time for advertisers' material (1 to 3 weeks if you telephone 1-800-225-5800).

IF YOUR NEED IS MORE IMMEDIATE, PLEASE CONTACT THE ADVERTISER DIRECTLY.

Ask your dealer for the Porta™ series from Skyline—to help you work faster and better!

PortaCalc™ — Model 100 "electronic spreadsheet" with 14 column by 26 row workspace! Full use of the built-in function keys to save, load, screen print, report print, or to look behind the data at the formulas in use.

Full arithmetic operators including exponentiation, absolute value, integer, summation, and averaging. Calculations are done to 14 digits of precision and displayed up to 9 digits. User selectable decimal place from none through seven—not just one, two, or floating! Formula replication is included to allow fast creation of worksheets.

Worksheets may be saved, loaded, or merged using the computer's memory or cassette. Often used templates can be saved in memory for instant recall.

Two powerful utility programs are included with **PortaCalc** at no extra charge! **PortaDex**™ is a data exchange program that allows reformatting **PortaCalc** files into the DIF format used by ***VisiCalc***. **PortaPrint**™ is an enhancement to the Model 100's text editor, adding the ability to adjust left, right, and top margins, and page length. Page numbering, headers, centered lines, flush right justification, new page control, and more.

Comes with extensive documentation in padded 3-ring binder. Includes tutorial, detailed reference section, and executive level sample templates. Fully illustrated with screen prints, examples, and hints.

PortaStat™ — Correlation, regression analysis, and descriptive statistics package, designed to be a working tool for today's businessman. Data can be input from cassette, memory, or keyboard. Interactive with **PortaCalc** data files! Thoroughly documented, includes tutorial.

PortaFin™ —Present value, net present value, future value, annuities, interest factors, loan constants, internal rate of return and more! This user-friendly package prompts you for the needed input data, then gives you the answer to your loan or investment problem! Interactive with **PortaCalc** files, allowing you to "read" cash flow data from memory. Keyboard or cassette input also available.

PortaMax™ — The powerful 'simplex' method of linear programming. Find the optimum 'mix' for a given set of constraints. Interacts with **PortaCalc** files to avoid time-wasting repetitive data entry. Tutorial, examples, and bibliography included.

PortaFolio™ — Stock and bond valuation, betas, Macaulay's duration, yield to maturity, bond swap calculations, and much more. All in an easy to use program, interactive with **PortaCalc** data files. Supplied with comprehensive instructions and reference manual.

PortaCalc

All **Porta** series programs are supplied on cassette and require 24K RAM.
Pricing — PortaCalc is **$69.95,** all others are **$44.95** each.
If ordering direct, add $2.00 shipping and handling per order.
Dealer inquires invited.

VISA MasterCard

Model 100 is a trademark of Tandy Corp. VisiCalc is a trademark of VisiCorp. DIF is a trademark of Software Arts

Skyline MARKETING CORP

4510 W. Irving Park Rd. • Chicago, IL 60641 • (312) 286-0762

Circle No. 54 on Reader Service Card

NEW PRODUCTS

DISK DRIVE FOR 100 OFFERED BY TEXAS FIRM

A portable, durable, disk drive is available for the 100. Engineered by Portable Computer Support Group in Dallas, the drive features a Shugart MIC 3.5-inch micro floppy disk with a transfer rate of 19,200 bits per second.

Specifications are impressive: weight, 3 pounds; size in inches, 1.8 by 4.25 by 10. The battery life is two hours with normal usage. This means 10,000 pages of type-written data can be stored to disk between recharges. By going into a "sleep mode" battery life is prolonged and will go 30 days without needing a recharge.

A battery pack that plugs into the wall includes: built-in rechargeable nicads, the drive itself, a cable to connect it to the computer, and battery charger.

Connecting via the RS-232 serial port, this operating system can employ other languages besides the one that comes with it. And in effect, there are two operating systems: one in the disk drive and one loaded in the software. This is rigged so the 100 can *learn* how to talk to the disk drive, otherwise the only option would be through TELCOM, "very time consuming," say the producers.

Since all accessing and saving is done through the disk drive, instead of through Telcom, resetting such things as stack parameters is eliminated.

Software available through the Portable Computer Support Group will remain the same; versions for the disk drive, such as Data+, are soon to come. The disk designers are inviting program writers to write software to support the new drive.

Briefly, to initialize the program, the user loads it through cassette. The drive is then hooked up, and you move the cursor to the operating system and enter. Immediately you see the RAM directory (same as main menu). By pressing F1, the disk directory appears; it can consist of 19 subdirectories . . . or single files stored there. Each subdirectory also can consist of 19 more subdirectories; this is limited only by the 100's capacity of 19 files. You can save a single file to disk or an entire RAM to disk as a subdirectory.

A spokesman for the group said the drive operating system "will be very general-purpose," and will work with NEC and other portables as well.

PLUG-IN ROM HAS PROGRAMS FOR HAUT HACKER

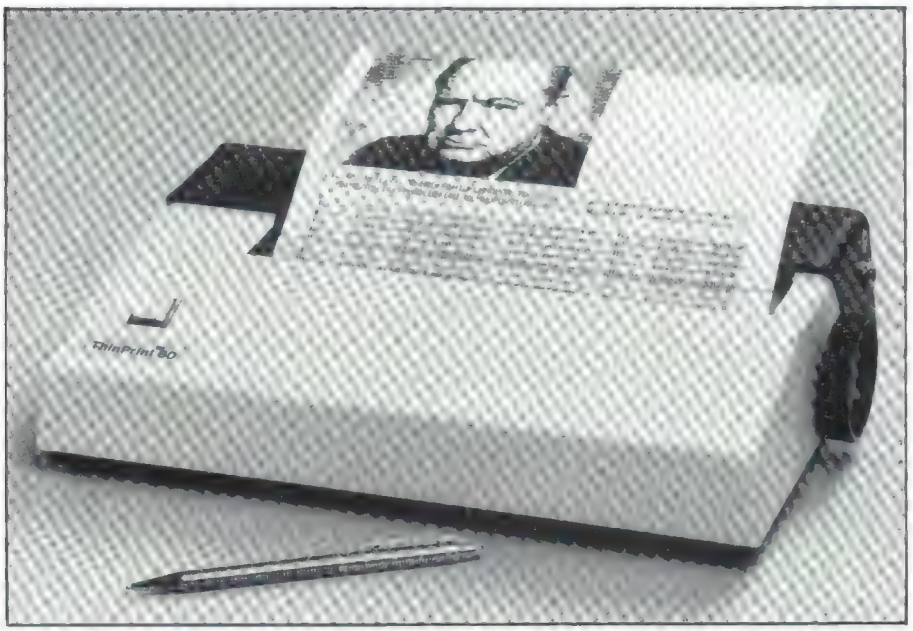
A ROM chip containing Basic utility programs and fitting into the ROM socket beneath the 100 is being offered by an Alaskan manufacturer.

The utilities within the ROM allow a programmer to renumber Basic programs; reassemble assembly-language programs in 8085 machine code and debug them interactively; and files can be sized, copied, and compared for equality.

The ROM (to be inserted in your 100) and complete documentation can be obtained for $79.95 plus $3 shipping from Polar Engineering and Consulting, 3013 Cottonwood St., Anchorage, AK 99508.

TRAVELING SOFTWARE OFFERS TEXT PROCESSOR

On the move with your 100 requires text processing software offering both text editing and formatting features. Traveling Software of Seattle, WA, has a product designed to do both.



Traveling Writer adds WordStar and MailMerge print capabilities to the 100, as well as the NEC and Olivetti M-10. The package includes the Traveling Data Manager which allows for the selection and merging of information used with the Writer's MailMerge-like option. Through Data Manager, Traveling Writer integrates with all Traveling Software's Business Manager Series.

Traveling Writer sells for $49.95, plus $2.50 postage and handling. More information is available from Traveling Software Inc., 11050 Fifth Avenue NE, Seattle, WA 98125, 206-367-8090.

BATTERY-POWERED, LIGHTWEIGHT, THERMAL PRINTER

Weighing-in at four pounds, The ThinPrint 80 from Axonix Corp., Salt Lake City, is a full-page printer that easily fits into a standard briefcase.

It prints text at 40 characters per second, and features bi-directional printing, 80 or 136 characters per line and serial or parallel interfaces. The unit prints on single sheets or rolls of paper fed from its internal paper compartment.

The suggested retail price of $279 includes batteries, an AC adapter, and an 80-page roll of paper.

Contact Axonix Corp., 417 Wakara Way, Salt Lake City, UT 84108, 801-582-9271 for more information.

THE PORTABLE SECRETARY

$34.95

• Never miss an important appointment or forget a daily activity! • Specify future events by: Date, Time or Both! • Create a list of prioritized tasks to accomplish! • At the exact time and date specified, the computer will sound a bell and display your message! • Accepts data from NOTE..DO or your own text file! • Pre-program special phone calls. The computer will "look-up" the number and place the call!

THE PORTABLE SKETCH PAD

$29.95

• Draw Pictures, Charts or just Doodle! • Fun for kids and adults alike! Machine Code routines allow: • Scrolling for almost unlimited vertical resolution! • Complete intermixing of text and graphics! • Ultra-efficient storage of the picture in memory! • Fast picture dumps to many popular printers! (Specify: Epson w/Graftrax, NEC 8023, Prowriter — Others Soon) • Pictures can be stored in RAM or on Cassette!

PASSCO

P.O. BOX 1528
CRANFORD, N.J.
07016

(Programs Require A Model 100 with a minimum of 16K RAM. N.J. Residents include sales tax.)

Circle No. 55 on Reader Service Card

100-TO-HOST COMMUNICATIONS ARTICULATED

Expensive memory-buffer capabilities found only on larger desktop terminals and micros are now available for the 100.

Laplog is PocketInfo Corporation's newest program for portables. A 100 user can scroll through all data sent or received during an on-line, interactive communication session with a host computer. Data can be reviewed while transmitting or receiving, a feature similar to multiple screen pages on larger systems.

The amount of data scrolled is limited only by the 100's memory capacity. Before Laplog, the 100 Telcom's SCRN function only enabled users to view the last eight lines of text.

Interested readers may request a free catalog containing LapLog and other products from PocketInfo Corp., P.O. Box 152, Beaverton, OR 97075, 503-649-8145.

FOOL'EM WITH MAGIC MICRO COFFEE MUG

The computer age couldn't grow much older without the likes of The Magic Computer Input/Output Mug. Computerists can take their coffee breaks in style.

When hot liquid is poured into the mug, one message disappears and another appears on the pictured monitor. "Programmer On/Off Duty,"

TEXT POWER 100™

A word-processor. 1,000 words per second, ultra-compact, 100% machine-language.

Only **TEXT POWER** gives the Model 100 all the pre-printing aides you need. **Page Plot™** to "see" up to 64 lines of text simultaneously on the screen. Display mode to preview your document. Page breaks, too!

PRESS ONE KEY, exit to the TEXT mode of your file. Return to TEXT POWER 100 with one keystroke.

Only TEXT POWER 100 gives so many printing options: Use the **LetterSetter™** for automatic vertical centering of a letter. Use our built-in **MERGE** for form letters AND mailing labels! Begin a new page or change margins from within the text file!

Printer control is easy. Single-letter codes turn on and off bold-face, double-strike, condensed print, super subscript and other print modes. Modes stay on until you turn them off.

Other features: Footer, header, page numbering, horizontal centering, top margin, bottom margin, left margin, right margin, page length, line count, page count, control codes. codes remain active through carriage returns, and a lot more. More than 37 features in all!

*49.95**

The Covington Group • 310 Riverside Dr., Suite 915 • NYC, NY 10025 • 212 678-0064 • 864-1700

Payment: We accept Visa, MasterCard, Money Orders and Certified checks. Make checks payable to **The Covington Group**. Checks require bank clearance. ***Order information: $49.95 plus $2.00 Shipping & Handling.** N.Y. residents add sales tax. Specify brand name, model number of your printer. Include $10.00 for each additional printer. TP100 **DOES NOT** support **SERIAL** printers unless you use a parallel-to-serial converter. Linefeed "patch" program supplied at no additional charge if needed. **Technical information:** Size: TP100 is under 2500 bytes long, depending on the printer supported. Operating speed: in excess of 5,000 cps. Bytes free to operate: 256. Hardware: Any Model 100 computer, from 8K to 32K. THIS PROGRAM DOES NOT OPERATE ON THE NEC PC-8201A, send a self-addressed, stamped envelope, and we'll let you know as soon as the NEC version is ready. A NON-PRINTING version of TP100 with most features is available on Compuserve free of charge in the Model 100 XA0 data base. Type GO PCS-154 and download TP100.DOC, TPHEX.DO, TPLDR.BA

Circle No. 56 on Reader Service Card

"Computer Expert On/Off Duty," and "Computer Nut On/Off Duty" are the three versions currently available.

The mug retails for $8.95, plus $2 for shipping and handling. Other Sweet Gum Inc. items for the computerists and hobbyists are presented in a free catalog.

The catalog or mug may be ordered by writing Sweet Gum, 15490 N.W. 7th Ave., Miami, Fl 33169 or by calling toll free, (except Florida residents) 1-800-237-9338.

16K MINIMUM DOODLE PAD AND SECRETARY

Two software products from Passco promise to keep the tardy up-to-date and the fidgety occupied.

The Portable Secretary accepts data on the 100 from NOTE.DO, or from your own text file, and remembers appointments and activities for you both daily and future. Exact times and date are specified by the sound of a bell and a message displayed; special phone numbers can be "looked up" and called.

The cost from Passco is $34.95 ppd.

The Portable Sketch Pad, also from Passco, draws pictures, charts, or doodles. The picture gets stored in memory or dumped to many popular printers i.e. Epson, NEC, and Prowriter. Pictures also can be stored in RAM or on cassette.

Software price is $29.95 ppd.

For more information on either package, contact Passco, P.O. Box 1528, Cranford, NJ 07016.

THE CASE

FOR EVERY CASE

The **Chip-Tote™ PCD-1** by Kangaroo Video Products Inc., makes your TRS-80 Model 100 truly complete. It's a compact, light-weight, foam padded soft case that doubles as a desk.

Businessman, journalist, professional or hobbyist—the **Chip-Tote™ PCD-1** provides the maximum in portability and protection for your computer and its accessories.

Kangaroo Video Products Inc. has been the leader in protecting T.V. cameras and video tape recorders for professionals worldwide. Now we have brought our thoughtful design and quality construction to the portable computer industry.

The **Chip-Tote™ PCD-1** features:

- Slim, handsome design
- Made of rugged Cordura® nylon
- Fully padded with Evazote® closed-cell foam
- Non-scratch lining won't mar display screen
- Double-zip zipper for easy access
- Stand-up utility top holds papers upright for easy reference
- Pockets hold papers, notepads, business cards
- Detachable zippered pouch holds batteries, modem cord, acoustic coupler, AC adapter
- Convenient hand strap
- Comfortable adjustable shoulder strap
- Also fits the Epson HX-20 and NEC PC-8201

The Kangaroo **Chip-Tote™ PCD-1** is available in black or smoke gray for $59.95. Include $2.50 for UPS shipment (CA residents add 6% sales tax). M/C, Visa, C.O.D. orders excepted—or mail check or money order to:

KANGAROO VIDEO PRODUCTS INC.
10845 WHEATLANDS AVE. SUITE C • SANTEE, CA 92071-2856 • (619) 562-9696
Circle No. 57 on Reader Service Card
ENGINEERED CASES FOR SENSITIVE ELECTRONIC EQUIPMENT

MICRO BOXES MAKE PAPER EASY TO HANDLE

Computer Peripheral Products Inc., Denver, CO, is marketing stock format computer paper in unique mini and micro boxes for the home and professional market. The 1-inch- and 3-inch-thick boxes contain 9.5-inch-by-11-inch or 14.8-by-11-inch paper which can feed directly from box to machine.

Designed as "brief case boxes," the containers are stackable, storable, reusable, and portable. A variety of paper weights and qualities is available, enabling each machine user to have a managable supply of the right kind of paper on hand. The boxes can also be used to file the processed forms when the job is completed.

The boxes are priced from $5.20 to $24.45, depending on the kind of paper and its weight.

LOW COST DATA SYSTEM SECURITY LINK

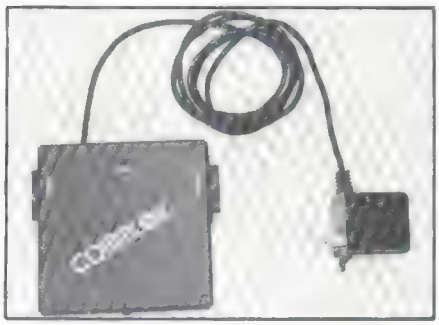
Readers of *Portable 100's* April issue wanting to insure only authorized personnel use Jerry O'Dell's War Games program to access the main frame at the office may be interested in an offering by ADM concepts.

It has made a unique design in computer links called Commlock. Now corporate, military, and private computer data banks may be secured.

Locating a Commlock link between the computer and modem at the computer site and one between the modem and terminal at the remote site provides a low cost solution to securing the communication link. It's programmable by the user to create up to 1024 unique encryption codes.

Commlock is programmable for data rates (300 to 9600 bits per second), word length (5 to 8 bits), parity, and number of stops bits. This makes Commlock compatible with all standard asynchronous communication. The cost is $600 in single piece quantities.

More information is obtainable from ADM Concepts Inc., 1445 Los Angeles Ave., S301, Simi Valley, CA 93065, 805-581-1202.



DOZEN PROGRAMS INCLUDE GAMES, BUSINESS SOFTWARE

A baker's dozen of 13 programs for the Model 100 is being offered by Billcomp Services, RD#1 Box 151 B, Corsica, PA 15829.

The programs include mailing list, calculator, loan payment calculator, Yahtze, bingo, charades, vocabulary tester, spelling practice, and math practice.

The games sell for $24.95, plus $2 shipping and handling.

CUSTOM CARRYING CASE FOR 100 FROM TOURISTER

From a famous line of luggage-makers comes a specially-designed carrying case for the 100. American Tourister has introduced the line to safeguard the 100 while enroute.

The case features an outer shell made of sturdy ABS and a custom foam interior cut to the exact dimensions of the computer. Security combination locks and an exclusive swivel cam lock provide extra protection for the case's valuable contents.

Interested readers may contact Special Products Division, American Tourister Inc., 91 Main St., Warren, RI 02885. ◀

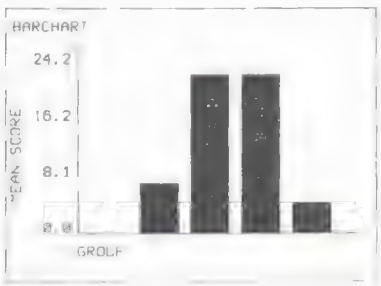
The Portable Statistician

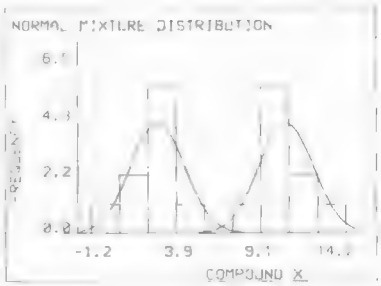
Software package to make your Radio Shack Model 100 and CGP115 color plotter into a portable statistics/graphics workstation.

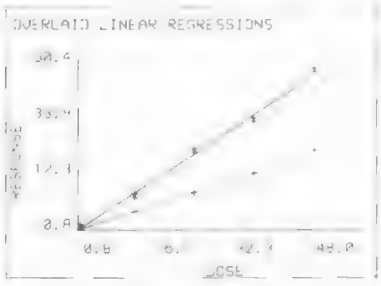
Features:

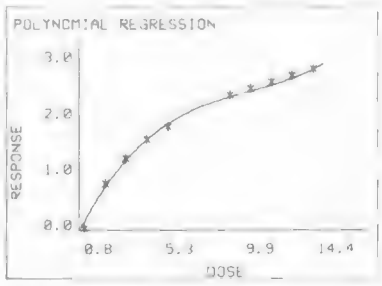
- Descriptive statistics
- t-statistics
- One-way, two-way ANOVA
- Repeated measures ANOVA
- Linear regression
- Nonlinear regression
- Multiple regression
- Chi-square
- Mixture analysis
- Histograms
- Scattergrams
- Barcharts
- Line charts
- Linear plots
- Nonlinear plots
- Normal dist plot
- FISHER's exact test
- YATES correction

ONLY $99.00









Also available for IBM PC and XT

TRS-80 is a registered trademark of Tandy Corporation
IBM is a registered trademark of International Business Machines Corporation

Works with 32k or 24k versions

Statware
7413 Lake Street
Morton Grove, Illinois 60053
312/248-8836

Circle No. 58 on Reader Service Card

Tired of waiting for slow cassettes?

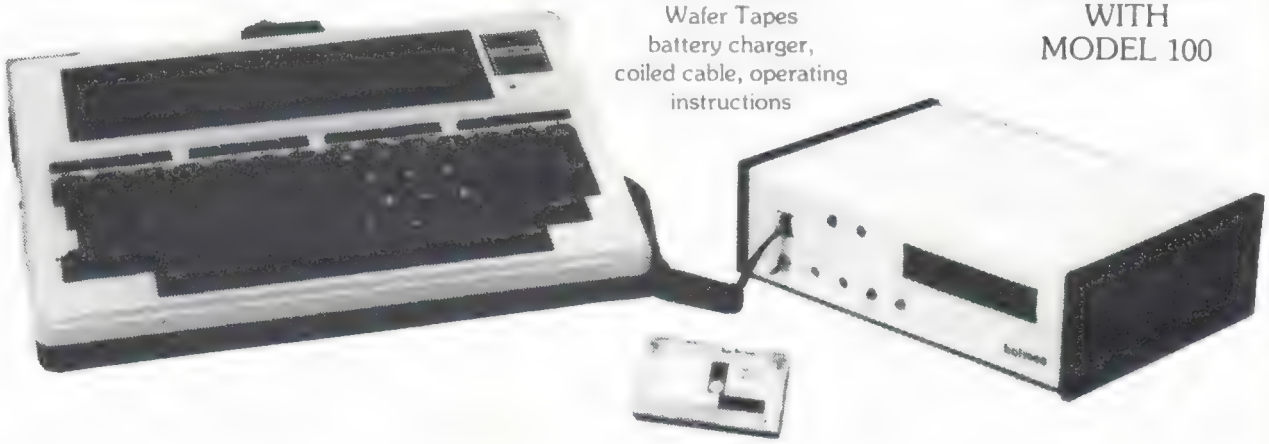
Holmes Engineering, Inc. has solved your problem with. . . the PMD 100™ Portable Micro Drive.

ONLY

$349.95

Drive Includes:
Wafer Tapes
battery charger,
coiled cable, operating
instructions

FITS IN A
BRIEFCASE
WITH
MODEL 100



WHAT IS THE PMD-100?

The PMD-100 is a HIGH SPEED storage system for SAVING and LOADING programs and files on the model 100 microcomputer.

USER FRIENDLY, menu driven software and a ROM based operating system are incuded.

The PMD-100 is faster and easier to use than cassettes.

PMD-100 FEATURES:

- Up to 70K storage per wafer
- 16K RAM Buffer
- Fast Data storage/retrieval
- Portable and light weight
- ROM based operating system
- Connects to RS232 port
- Rechargable battery
- Replacable wafer tapes

CALL AND ORDER TODAY!

ALSO AVAILABLE FOR THE MODEL 100
IM-100™, 8K RAM Modules Only $69.50
up to 32K memory upgrade - Plugs into M100 sockets
Easy to install - No modifications required

Holmes has a complete line of TRS80 model I, III and IV upgrade products.
Call or write today for a FREE product brochure.

HOLMES
ENGINEERING, INC.

Bus. Hours: 8-5:30 (MST) Mon. - Fri.
10-2:00 (MST) Sat. (Sales only)

5175 Green Pine Drive Salt Lake City, Utah 84123
(801) 261-5652 or 24 Hr. BBS (801) 263-1103

master charge

VISA

Call For Dealer Nearest You
Dealer Inquiries Invited
Full warranty on all products
Add shipping/handling for U.S. and Canada. All others add 15%. Prices subject to change without notice.

Circle No. 59 on Reader Service Card

TERRY KEPNER

FULL-DUPLEX

Editor's Note: Full-Duplex is dedicated to solving reader's Model 100 problems. Readers needing assistance should address their letters to: Terry Kepner, c/o Portable 100, 67 Elm St., Camden, ME 04843. Readers are reminded to include a return address with all Full-Duplex correspondence.

TO NICAD OR NOT

I've a 100; should I only use alkaline batteries, or can I use rechargeable nicads? A Radio Shack salesman said I could lose a file as the rechargeables only generate 1.25 volts. I did lose a file once for no apparent reason.

When the battery light comes on, the 100 stops functioning immediately; it doesn't run the 20-minutes indicated in the manual. Could this be a problem due to the nicads? Mine are Radio Shack AA batteries and I always run them all the way down so they won't recharge less than full capacity.

The 100 only runs about 12 hours with the batteries now, after 15 recharges. Will this change as the batteries get older? The salesman says his computer (32K) runs a month on one set of alkaline batteries at four hours per day. (I have 24K.)

Terry Clark
University of Chicago

▶ First, the nicad batteries put out a full volt less power than the 100 requires for operation. The 100 is designed to trigger the low-battery light when a certain level is reached. When the light comes on, the 100 uses its built-in nicad to supply extra power for about 20 minutes before it shuts down the computer. This is to conserve its energy to keep the RAM alive while you look for new batteries.

The nicads, since they start with a lower total voltage, have a shorter distance to drop before triggering this reaction from the 100. As a result, the nicads have a shorter usefull lifespan in the 100. All batteries have a decay curve that gets steeper as time passes. With the nicads, this curve makes the 100's internal battery unable to produce the required makeup power for more than a few seconds; hence the "immediate" power-down of the computer when the low-battery light comes on.

This is true of most nicads, although the more expensive and better built nicads may be able to extend low-battery operation from a few seconds to a few minutes.

Another problem with nicads is they develop a memory for their average recharge level. As a result they tend to drop out rapidly when this level is reached, hence, the advice to completely run them down before recharging.

The 100 is a different case: the low-battery light and operation is triggered when the incoming power drops to a preset level, not when the batteries are completely used up. If you're recharging the batteries when the 100 says they're inadequate, you're actually recharging them before they're completely discharged. As time passes, and the number of recharges increases, you'll end up developing a memory for their recharge level, shortening the time you can use the batteries without recharges.

I think the Radio Shack salesman was exaggerating when he told you he gets a month out of his 100 alkaline batteries; the best I can get is two weeks at four hours per day. I've ended up buying a six-volt lantern battery (a Duracell alkaline, $6.49) and can easily get two months or more of use at eight hours per day.

SPEEDY TYPIST

When I'm working on a large file (12K or more) and type fast, I can get far enough ahead to actually lose letters or whole words. Can this problem be overcome?

Also, when transferring files from my CP/M Superbrain computer to the 100, using PIP, I lose data if I go faster than 300 baud. From the 100 to the Superbrain I can go at least 4800 baud. Can you tell me what causes this and whether it can be corrected? Are both these problems related to the size of the 100's buffer?

My Superbrain only has a RS232 port; I'd like to find a printer which will work with it and my 100. What dot-matrix printer, with both RS232 and parallel interfaces are available?

Are there any dot matrix printers which can handle all of the international letters the 100 produces on the screen? I've tried the low-end DMPs, plus the old LPV from Radio Shack, and they print only a few.

Help!
New York, NY

▶ The limitation to the type-ahead buffer in the 100 is 255 characters; you must be really clipping along to fill that up! I'm sorry, but I don't believe you can correct that problem. Your only solution is to break your file into sections. Each new section will begin fast, slowing down as you make it bigger.

This problem arises because the computer inserts each typed character into the file by moving all the following characters up one byte. This leaves room for the new one. As long as you stay at the end of the file, you don't notice this since there're fewer characters to move around. At the head of the file, though, the number of characters moved is substantial, so you notice the slow down. (Don't forget the display must be updated also, which slows things down even more.)

When transmitting data to the 100, you're stuck with two primary limitations: BASIC or TELCOM. If you're

AUTOMATICALLY TEACHES TYPING

TUTOR +

Learn keyboard skills quickly and enjoyably

- 30 lessons fed from text files, presenting exercises at graded speeds
- After each lesson, or whenever you like, you are tested for current speed and accuracy
- Detailed, professional manual corresponding to lesson files.
- Has game mode for fun and excitement while learning.

TUTOR+ $39.95

INCLUDES CASSETTE AND EXCELLENT MANUAL

MC, VISA OR C.O.D.

PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

PCSG PROVIDES HOTLINE SOFTWARE SUPPORT FOR THE MODEL 100. CALL US AT: 1-214-351-0564

Circle No. 60 on Reader Service Card

using TELCOM, it can operate at a maximum receiving speed of only 1200 baud. This limitation is imposed by the response time of the LCD display: each time the bottom line of the display is moved up, every character on the display has to be moved, one at a time. If you could disable the echo to the screen of received characters, a drastic increase in the reception speed would be evident. As it is, 1200 baud is the maximum.

Also, the number of files you have in memory, and the size of that memory (8K vs. 24K vs. 32K) affects the reception rate of TELCOM. It has something to do with the methods used by Microsoft for the 100 memory management.

Basic is limited to 300 baud because it has to maneuver through the Basic interpreter for all of its instructions. So, if you open a data file in Basic and use a simple For-Next loop to input from the RS232 and store in RAM, each instruction in the loop must be interpreted by Basic everytime it's encountered.

Using the LOAD "COM" command in Basic would seem to eliminate that aspect, but it introduces its own problem: every line of ASCII data must be tokenized by Basic and in RAM before the next line will be accepted from COM. This tokenization and RAM storage slows Basic down to 300 baud as a working speed. And, as with TELCOM, the amount of memory in your computer will affect the speed.

The only way to overcome this RS232 problem is to write your own machine-language program that inputs data from the RS232, and stores it in RAM without displaying it or tokenizing it. Not an easy chore.

Several companies sell printers with both RS232 and parallel interfaces: Radio Shack, Okidata, and Mannesmann Tally are three I know for sure, but not all of their models have that feature. For more details about their printers, which range from $800 to several thousand dollars, write to Mannsmann Tally, 8301 South 180th, Kent, WA, 98032, 206-251-5524; or to Okidata, 111 Gaither Dr., Mt. Laurel, NJ, 609-235-2600.

If anyone knows of other printer manufacturers with dual interface units, please write and let me know about them.

Another option is to buy a printer-spooler, many of which have both parallel and serial port inputs and outputs. These are much cheaper than a new printer, if you already have one, and reduce considerably the amount of time wasted by the computer waiting for the printer to finish before it can resume computing. One of these printer buffers is SooperSpooler by Compulink, 1215 Ravenwood Rd., Boulder, CO.

The ASCII character set is standard only for the first 128 characters (0-127), by international agreements. All characters from 128 to 255 are arbitrary and vary from one computer and printer manufacturer to another. Radio Shack chose some of the characters in their foreign language set in the 100 to correspond with their printers, as far as the printers could match them, but that's all. I don't know of any printer which reproduces all the 100 foreign characters, although I wouldn't be surprised to see one appear on the market in the future.

WANTS GLOSSARY

I read with interest the program Jim Stutsman devised in the 1983 October issue regarding keeping the date from changing in the memu. But what do I do after I type it into Basic? Here's where the magazine sometimes leaves us beginners hanging. Do I save it? What are the steps to using these special programs?

And how about a glossary to explain some of the abbreviations readers use in their letters. For example, I keep seeing MEWS used. What is it?

Also, I have two computers: an Atari 800 and a 100, and only one printer. Is there a "Y" cable that would let me leave both computers attached to the printer so I wouldn't have to always unplug and plug the computers?

Lee Ellis
Indio, CA

▶ To use Jim's program, save it in memory as a Basic program (.BA) and run it whenever the menu date goes astray.

MEWS stands for Micro Executive Work Station, which is how Radio Shack advertises the Model 100.

I agree that acronyms are a problem; MEWS took me a few days to figure out. As a rule of thumb, though, a good writer always puts the meaning of an acronym in parenthesis immediately behind the acronym whenever there's the possibility it can be misunderstood.

Certain acronyms aren't explained because of what they symbolize. You don't need to know what the initials BASIC stand for; it's universal programming language . Neither do you need to have ASCII explained (American Standard Code of Information Interchange), except that it's the numerical method used for the characters in computers.

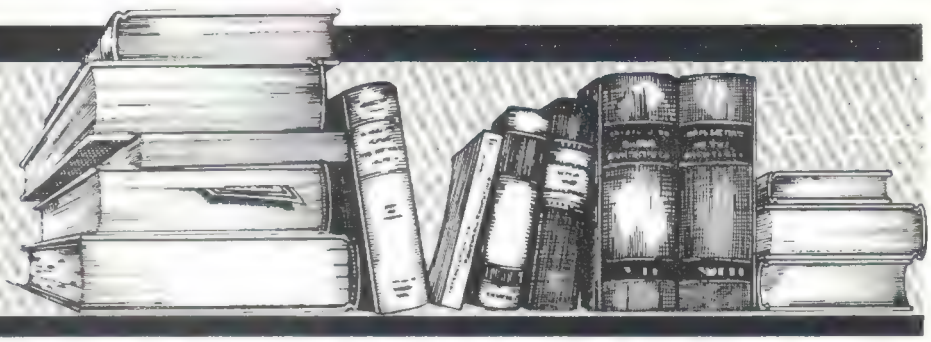
As for a glossary in *Portable 100*, the idea has been mentioned before to the editors.

Plugging the parallel ports of both printers into the same printer via a "Y" connector wouldn't be a good idea. Doing so would directly connect the ports of the two computers. If something were to go electrically wrong with one, both would be affected. In addition, the parallel ports of the computer may not be identical (the Centronics standard isn't followed very rigidly by all manufacturers). When one computer is sending to the printer, the other would be be loading down the data lines and intefering. Even if the other computer were turned off, the electronics would still respond, although not well, to the actions of the other computer port.

All in all, it could be a messy situation, even if it seems to work at first. Your best bet is to use a hardware device to switch between the two computers, connecting only one at a time with the printer. Some work mechanically, using a 36-pole, double throw switch; others use electronics. Neither is cheap. Unfortunately, I only could find one listed in my reference books: Jameco Electronics, 1355 Shoreway Rd., Belmont, CA, 94002, 415-592-8097. They sell the Centronics Selecto-switch in a two-way ($199.95) and a three-way ($229.95) configuration.

Another idea is to use a print-spooler that has both a RS232 and parallel input ports, such as the Compulink SooperSpooler mentioned earlier in this column. ◀

BOOKS



SOLUTIONS WITH MEWS

The Idea Book
David Ahl
Creative Computing Press
39 E. Hanover Ave.
Morris Plains, NJ 07950
141 pages
$8.95, softcover

By TERRY KEPNER

This book's name says it all: It presents 53 programs (although the subtitle indicates 50) that solve problems. The programs aren't the point; their problem-solving method is.

By using Basic keywords common to the Model 100 and NEC 8201A, David Ahl has designed listings that work on both machines. He avoids things like PRINT@, MID$ replacement, and LOCATE x,y. The result is the programs aren't as professional as you might expect. Nonetheless, they work well.

In his preface, the author makes several uncalled for disparaging remarks as to the capability of these two small computers, saying they have relatively small memories, can't store large data bases, and aren't suitable for extensive word processing or massive calculations.

PICKS ON LITTLE GUY. While the 100 and NEC don't have 128K of available RAM, neither do 90 percent of the other personal computers on the market. And as far as data bases are concerned, to handle large ones you only need disk drives or other mass storage devices. Remember, VisiCalc originally used only 32K of RAM. In fact, with proper mass storage, you only need about 24K of RAM for a good data base on any computer.

Word processing is also mass-storage dependent. The 32K Model 100 or 64K NEC 8201 provides much more writing room than any other common personal computer. (The Apple and Tandy word processors typically have only 15K to 25K of free RAM after loading the program.)

And with regard to math processing, the only personal computers with blinding speed are those which use special math coprocessors. Very few personal computers come with that option.

PROBLEM SOLVING. The book presents a problem, offers mathematical equations for solving it, then competently describes the variables, difficulties, and reasons for solving the problem.

After this discussion, Ahl lists the program and shows several trial runs with sample inputs and outputs. Each presentation aims at providing readers with the techniques and skills needed to create their own programs for problem solving. It reminded me of a training puzzle book for programmers. The programs are heavily oriented towards math, with only a dozen or so being immediately practical.

NINE CHAPTERS. The book is divided into nine chapters:

- Drill and Practice (four programs: addition practice, addition practice adjusted by grade level, time/speed/distance problems, and kinematics);

- Problem solving (seven programs: how many tickets; drinking and blood pressure; quadratic, exponential, and simultaneous equations; roots of functions; and plotting a function);

- Sets and repetitive trials (nine programs: four programs solving intersections of sets, greatest common denominator, prime factors, cryptarithmic problems, calculating numbers with infinite accuracy, and numerical palindromes);

- Convergence and recursion (six programs: length of a curve, converging on square roots, "e" and pi, change for a dollar, and change for five dollars);

- Compounding (six programs: interest, two savings programs, loan payments, credit purchases, and population growth);

- Probability (six programs: two solutions for Pascal's triangle, common birthdays, coins, baseball cards, and system reliability);

- Geometry and calculus (four programs: crossed and slipped ladders, distance between two points, area by calculation, and area by integration);

- Science (six programs: gas volumes, Charle's law, Boyle's law, photoelectric emissions, moth mutations, and projectile motion); and

- Potpourri (five programs: Number guessing, lunar lander, Hammurabi, smog simulation, and depreciation).

FIFTY-THREE. If you've been adding, you'll note that there're more than just fifty programs, it actually comes to fifty-three. This balances out with the three problems that have two program solutions, so the net number is actually fifty problems solved.

If you're interested in problem solving, and not just looking for a book of specific programs, this book is worth buying. The problems are clearly stated, and solved. After each solved problem are several suggested problems for you to solve on your own. Unfortunately, solutions aren't provided for these, so if you have trouble, you're on your own. ◀

THE *executive* TIME MACHINE

$29.95

PLUS SHIPPING & HANDLING

PUTS TIME AT YOUR FINGERTIPS

— Applications —

- meetings
- anniversaries
- birthdates
- payment reminders
- car maintenance reminder
- medical appointments
- option dates
- call dates
- contract dates

— Features —

- marks current date
- 12 hour time (AM/PM)
- arrows show appointments
- sorts day's appointments by time
- reads appointments from NOTE.DO
- save appointments a year in advance
- detects leap year
- fast response
- easy to use

We ship 1st Class Mail within 24 hours

When ordering please provide:
NAME
ADDRESS
CITY/STATE
ZIP CODE
PHONE
CREDIT CARD NO.
EXP DATE
Master Card holders — include interbank no.

Call our 24 hour orderline
619-695-1385

or 619-566-6013, 9 — 5 p.m. PST weekdays
or send check or money order to:

EVS ENGINEERING

9528 Suite 35, Miramar Road
San Diego, CA 92126

"Serving the Defense and Space Industry since 1979"

Please include the following:
$2 postage and handling
U.S. funds only
CA residents add 6% tax
COD orders add $2

Dealer inquiries invited

Personal checks – OK
we won't make you wait.

Circle No. 61 on Reader Service Card

ThinPrint 80

FULL PAGE PRINTING IN A 4 POUND PACK

At last, a rugged battery-powered full-page printer that fits in less than half a brief case.

"ThinPrint™80" supports either serial or parallel interfacing to most computers including:

- ☐ Tandy 100 & PC-2
- ☐ H.P.-75C
- ☐ EPSON HX-20
- ☐ NEC 8201A
- ☐ IXO Telecomputer
- ☐ Compaq
- ☐ IBM PC XT, JR
- ☐ Workslate

and many others.

Features include:

- Weighs only 4 pounds
- Size: 2½" H x 7½" D x 11½" W
- 80 or 136 columns per line
- 40 C.P.S. bidirectional printing
- 2048 character buffer memory
- 120 dots per inch graphics
- Silent thermal printing
- Holds 80 pages of 8½" wide paper
- 5 years of proven reliability

ThinPrint 80

Your portable computer's best friend.

At a suggested retail price of $279 complete*, it adds professional portable printing at a very friendly price.

*Includes rechargeable batteries, AC adapter and one roll of paper.

For more information and the name of your nearest Axonix dealer call toll free: **800-821-7093** or in Utah 801-582-9271.

AXONIX CORPORATION • 417 WAKARA WAY • SALT LAKE CITY • UTAH 84108

Axonix™

Tandy, H.P., N.E.C., Epson, Compaq, IBM, IXO, and Workslate are registered trademarks of Tandy Corp.; Hewlett Packard Co.; NEC Home Electronic (USA) Inc.; Epson America, Inc.; Compaq Computer Corp.; International Business Machine Corp.; IXO Inc.; and Convergent Technologies Inc.; respectively.

MISLEADING TITLE FOR A WORTHY BOOK

Hooking In: The Underground Computer Bulletin Board Workbook and Guide, 1984 edition

Tom Beeston and Tom Tucker
Computerfood Press
Box 6088,
Oracle, Az 85623
172 pages
$12.95 in book and computer stores
$14.95 postpaid from above address, softcover

By HENRY KISOR

So here you are, telecomputing all over town with your Model 100 and modem, and you can't make head nor tail out of what the electronic bulletin board is telling you.

"How many nulls do you need?" the board asks. What the dickens is a null? Maybe if you press the 100 enter key, it'll go away. You do . . . and it does.

"Can your terminal display lower case?" is the next question. The answer is logical, and you type: Yes. But in a few seconds the following is displayed:

Function (B,E,R,S,K,G,W,C,U,P, X,Q) or '?' if not known) ?.

You type ? and a list of options scroll on the screen. You want to try these new commands, but you're uneasy. All these strange new things take time to learn. Each bulletin board you call has a different setup: Apples, TRS-80s, CP/M, IBM, etc.; who's got time to learn them all? And your spouse hasn't been very pleasant about the phone bill you ran up last month while making your first tentative forays into the wonderful world of telecomputing.

GET HOOKED. What you need is *Hooking In: The Underground Computer Bulletin Board Workbook and Guide*, 1984 Edition by Tom Beeston and Tom Tucker. Unlike most books on telecomputing, which attempt to touch every base on the subject, this first-rate guide concentrates on what you can do with electronic bulletin boards. It'll save you a lot of time and trouble, especially if you're a rank beginner.

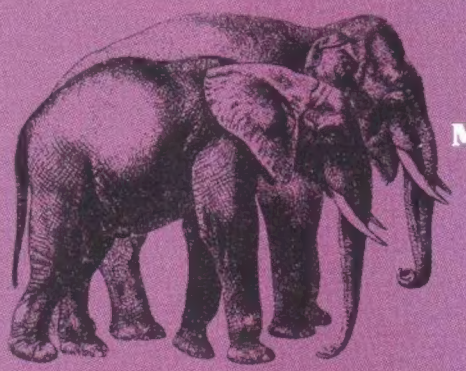
Disregard the silly underground label in the title, which sounds as if the authors are refugees from the alternate culture of the 1960s. They simply intended to give a sexier meaning to "little known," an accurate description of the status of bulletin boards in the general public's mind.

Hooking In begins with a brief but lucid explanation of what a bulletin board is and who runs it, then jumps to a thorough but terse discussion of what you need in order to connect with one: modems and their allied software.

A TO Z. Next the authors outline what you'll find on bulletin boards: "Everything from Apple pie recipes" to "Which Zoos have Zebras," with "a few x-rated subjects on the way." (There are many punctuation glitches, a common failing of computer books quickly produced by small publishers, but most readers won't care.)

What follows is a very good discussion of RCP/M systems (Remote CP/M, or boards devoted to that operating system), and the history and what they offer . . . astonishing qualities of free

FOR THE RADIO SHACK MODEL 100 & NEC 8201



8K MEMORY MODULES

50% OFF

We Make Expansion Easy!

- Each memory module offers you an additional 8K. Add 1,2, or 3.
- You can increase your present memory capacity up to 32K in a matter of minutes.
- Easy installation, with just a screwdriver, and no electronic knowledge required.
- **Save time . . . your computer never leaves home!**
- **Save money . . . competitively priced & no installation charge!**

Purple Computing guarantees full satisfaction and ease of installation or return within 90 days for a prompt refund.

$59.95 8K x 8 CMOS/RAM

****Special Offer****
(with purchase of a memory module)
Centronics/Model 100 printer cable - $11.95
No frills direct connect Modem Cable - $9.95

PACK A PURPLE MODULE IN YOUR COMPUTER

Purple Computing • 2068 Ventura Blvd • Camarillo, CA 93010
(805) 987-4788

Product	Quantity	Cost
8K Memory Module	_____	$_____
Printer Cable	_____	$_____
Modem Cable	_____	$_____
	CA. Residents only, 6% tax	$_____
	Total Cost =	$_____

Price includes postage & handling. Shipped from stock.

☐ check
☐ money order ☐ VISA ☐ MasterCard Acc't. #_____ Exp._____
Signature _____
Name _____
Address _____
City _____ State _____ Zip _____

Circle No. 62 on Reader Service Card

public domain software for downloading to your computer. It explores the log-on procedures, suggests some of the best general purpose utilities available, and even goes into ZCPR2, a popular public domain replacement for the standard CP/M command console parser. (Never mind what that is if you're not a CP/M expert; you don't need to know.)

There are games and communications programs too, and the authors carefully outline what you must do in order to download them.

SYSOP. One chapter discusses what you need and what to do if you want to be a sysop, or system operator, of your own bulletin board. The authors make some very sensible suggestions for creating specialized boards that address a definite public need (political forums, restaurant reviews, clearinghouses for various things such as bulletin board phone numbers).

Though they mention sysops risk abuse from inconsiderate callers, obscene messages, and crashing of systems, the authors don't indicate what a widespread headache this has become. Maybe that's just as well. This isn't a handbook for the sysop, but for a newcomer to telecomputing.

ESSENCE IN SEQUENCES. Examples of actual log-on sequences make up the bulk of the following chapters, and these are among the most valuable information *Hooking In* provides.

First, the book walks you through an entire questionaire on a Dial-Your-Match computer dating board and a sample session (including downloading a program) on a RCP/M. The following pages offer sample command menus for ABBS (Apple Bulletin Board System), A-C-C-E-S-S (Apple-based), Bullet-80 (TRS-80), CBBS (Ward & Randy's CP/M based-board, the granddaddy of them all), Commodore, and PMS (Apple) boards.

A handy quick-reference list of a few hundred bulletin boards around the country follows, sorted by area code and number. Remember, such a list is ever-changing, for boards go in and out of existence every hour. So this list was obsolete the minute it was compiled.

The numbers and descriptions are then repeated in a 55-page "BBS Workbook" arranged by state and to be filled in with your comments and number changes, where appropriate.

A GRIPE. Here lies my only complaint about this book. It would have saved a few trees if the authors had provided just one sample page with blanks to be filled in, to be photocopied as many times as the reader needs. The space saved could have been devoted to a few more bulletin board types, such as TRS-80-based MCMS and IBM-based PCM systems.

Just a few pages are devoted to the on-line logbook that follows, but they also could have gone the copy-machine route.

These, however, are minor flaws, and when you study the excellent closing chapters, you won't complain. They contain rosters of modem manufacturers and software vendors, buyer's guides to modems and communications software, and lists of commercial on-line data bases, user groups, bulletin board programs for sale, directories, newsletters, and books and magazine articles devoted to telecomputing topics. There's also a glossary of computer terms.

MONEYS WORTH. All in all, *Hooking In* is one of the best books on telecomputing I've come across, especially for the beginner. But even the expert will find considerable value in its wealth of information. On the computer bookshelf, increasingly crowded with insipid and banal beginners books, *Hooking In* is both original and substantial, and a bargain for its $12.95 price.

The authors plan to update it frequently . . . I'm already looking forward to the 1985 edition.◀

Henry Kisor works for the Chicago Sun-Times *as full-time book editor and critic, and as part-time computer columnist.*

Advertisers Index

PG	RS#	Advertiser
19	17	Alphaware
6	5	Alpine Data System
CIII	64	American Micro
C-4	65	American Tourister
27	22	ARMS
62	51	Avion
78	63	Axonix
61	50	Bluestem
43	32	Billcomp
48	36	BRS
64	53	Ceres
63	52	Chattanooga Choo Choo
49	37	Chattanooga Systems
47	35	CompuServe
18	14	Compute Account
18	15	Consultant Services
69	56	Covington
44	34	Custom Software
15	12	Dataccount
43	31	Dataccount
9	8	Datamasters
19	16	DFW
59	48	Diskus
21	19	Elexor
77	61	EVS
56	46	Fidelity
27	23	FACS
51	42	Ft. Worth
31	25	Gunther International
72	59	Holmes
42	30	In The Bag
51	41	IRD
70	57	Kangaroo
37	27	Kensington Micro
17	13	Key Solutions
8	7	KJM Development
44	33	Menlo
10	9	Micro Byte
23	20	Micro Demon
49	38	Micro-Help
5	4	PG Design
42	29	PG Design
50	39	Pocket Programs
53	44	Pocket Info.
CII	1	PC Support Group
34	26	PC Support Group
12	10	PC Support Group
55	45	PC Support Group
74	60	PC Support Group
28-29	24	PC Support Group
68	55	Passco
79	62	Purple Computing
60	49	Polar
40-41	28	Radio Shack
65		Reader Service
71	58	Statware
21	18	SIG
66	54	Skyline Marketing
50	40	Skyline Marketing
1	2	Soundsight
13	11	Software-plus
8	6	Stephens
52	43	Susie Software
58	47	Target Systems
3	3	Traveling Software
16		800 Number
24	21	Quastatronics

FULL-FEATURE SPREADSHEET
Application Templates
For Your Radio Shack TRS-80 Model 100/NEC PC-8201A Portable Computers

AMPI's AmericanCalc Spreadsheet—designated TPlan for the Radio Shack TRS-80 Model 100, and NPlan for the NEC PC-8201A—is a full-feature spreadsheet program. It has the following features: handles up to a maximum of 90 rows or 26 columns; cursor movement is left, right, up, down, and go to any location; accepts data entries for numbers, labels, and formulas; formulas include addition, subtraction, multiplication, division, power, trigonometric, integer, absolute, natural logarithm, and exponentiation; replicate numbers or formulas; insert or delete rows or columns; copy, save, load, and screen dump; and built-in calculator. The program is shipped with bound instruction manual, pre-recorded audio tape, and vinyl album case.

This popular spreadsheet now has three new templates especially designed for busy people who do not have the time to set up their own spreadsheet applications. Once the TPlan or NPlan is loaded, simply select and load the application template that fits your particular need. The three new templates are:

Financial Management — Includes T Plan and N Plan application templates for: Stock Portfolio, Home Ownership, Home Budget, Life Insurance Requirement, and Personal Check Register.

Business Management — Includes T Plan and N Plan application templates for: Income Statements, Balance Sheets, Business Start-up, Break-even Quantity, and Expense Analysis.

Sales and Marketing Management — Includes T Plan and N Plan application templates for: Sales Forecast, Profit Mark Up, Sales Analysis, Project Cost Estimate, and Advertisement Efficiency Measurement.

AMPI also has available several additional new software programs for the Radio Shack TRS-80 Model 100 and NEC PC-8201A. These include: Income Property Analysis, Portfolio Analysis, Curve Fitting, Histogram and Plot, Equation Solver, RPN Calculator, and FORTH.

Write for free catalog listing additional Radio Shack TRS-80 Model 100 and NEC PC-8201A business and engineering programs.

AMERICAN MICRO PRODUCTS, INC.
705 North Bowser
Richardson, Texas 75081
(214) 238-1815

© 1984 American Micro Products, Inc.

Circle No. 45 on Reader Service Card

A CASE THAT'S AS ADVANCED AS YOUR COMPUTER!

A. The strong stainless steel tongue and groove frame, designed for moisture and dust resistance, is the only one of its kind.

B. Secure three-point latching is provided by lock and key combined with an easy to use combination lock. Our Sureglide™ cam action swivel closures hold even when the case is dropped.

C. Customized foam interior is die cut to fit and protect your computer. On larger cases the lid is padded with convoluted urethane foam for complete protection. On 20" cases the lid contains a folio designed to hold floppy discs, full 15" printout paper and manuals.

D. A sturdy wall of high impact resistant ABS (used in football helmets and auto bumpers) provides durable outer protection as well as good looks. The inconspicuous exterior of the case camouflages your computer for added security.

E. Comfortable padded handle makes carrying easy. Larger models also have easy glide reinforced wheels and the convenient T-bar pull handle that flips up when you need it, folds down for travel.

American Tourister computer cases offer you a way to carry, protect and camouflage your personal computer or printer in style. They're built with the same high quality and features that have made American Tourister luggage famous for more than 50 years.

Quality control atmospheric, stress and "abuse" tests maintain the strict American Tourister quality standard. And in the event of loss, damage or theft, the unique American Tourister lifetime case registration program will verify the date of purchase for insurance claims. Available in metallic graphite gray and classic black.

FULL ONE YEAR LIMITED WARRANTY
30 DAY MONEY-BACK GUARANTEE!
USE YOUR VISA, MASTERCARD OR AMERICAN EXPRESS

TO ORDER, CALL TOLL FREE **1-800-341-6311**
IN RHODE ISLAND, CALL 401 273-2020.

© 1983 American Tourister®, Inc. 91 Main Street, Warren, RI 02885